Lake Huron Fisheries Assessment Unit
Report 1-91

Status and Outlook for the Major Commercial Fish Species of Lake Huron, 1991

Ontario
Ministry of
Natural
Resources

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INTRODUCTION

The commercial harvesting of fish from Lake Huron is controlled through area specific allocations and licencee specific quotas which are subject to annual review and revision. This document, in both its timing and content, is intended as a companion to that process.

It traces annual harvests over a 12 year period (1979-1990) and relates those harvests to the allocations for those years that quota-control has been in place. Likewise, it traces the relative abundance of the primary commercial species through statistics derived from the commercial fishing reports. The character of the harvest and to a lesser extent of the populations in the lake is made known through age and size statistics which come from on-board sampling of representative commercial catches. Together, these pieces of information describe the state of the fishery in the previous year and give insight into the supply of catchable fish being carried over into the current year. This is still only part of the picture as the total supply of fish is dependent as well on the number of fish which will grow into the catchable-size range ("recruits") during 1991. A tracking of year to year changes in reproduction ("year class strength") has been undertaken through independent fishing and those results are presented, together with comments on the likely impact of the recruiting year classes. Finally, forecasts of changes in the supply of commercial fish are made on the strength the composite picture developed.

The document is also intended as an atlas of summary statistics to facilitate further analyses by management and research staff, particularly analyses which fall within our conceptual management model but go beyond our current time allowance. With this purpose in mind, much of the material is presented in both graphical and tabular form, many of the tables being contained within an appendix.

The fundamental unit of organization within the report is the management area (see Figure 1 for areas). Each such section opens with a table presenting 1990 statistics for allocation (total of quotas), harvests and landed values, by species. Beyond this there are species divisions wherein measures of harvest, fishing effort, and abundance (catch-per-unit-effort) are given in graphical form and the age composition of catches, if known, is tabulated. Should a management area contain more than one assessment area (see Figure 2), there may be a further breakdown of statistics by these smaller subdivisions.

Index fishing is carried out at few locations within any basin (Figure 1). Estimates of pre-recruit abundance derived from these separate projects appear within the respective management area sections of the document. Where we extrapolate recruitment forecasts from these to other management areas there is cross-referencing to allow the recruitment indices to be readily found.

Discarding of portions of catches is a practice which has taken on new meaning since the introduction of quotas. At one time it was largely confined to the usually small part of the catch which failed to meet quality standards. Beginning in about 1985, discarding came to include varying proportions of the catch which in terms of market acceptance were of lower grade. The increasing amounts of fish involved have biased fishery statistics, especially for chub where the practice is most prevalent. For the first time, an effort is being made to correct for this bias, as will be seen in some graphs where the retained and discarded portions of the catch are separately shown. Where possible we have attempted to draw attention to the change in discarding practices by flagging the year of first detection with an arrow.

Reports submitted by commercial fishermen have long been an important source of stock assessment data. In 1989, a new form and reporting procedures were introduced in southern Lake Huron on a trial basis to allow reporting of catches daily as they are being landed. In many respects the new system has the potential for returning better data.

At the same time, it has brought about changes in the reporting of fishing effort which produce alterations in computed catch-per-unit-effort (CUE) statistics. Previously, effort was assigned to a species if any of that species was caught. Currently, fishermen report the species for which a net is explicitly set and only this "directed" effort is used in computations. The differences will not be drastic, but they may cause some shifts in CUE, usually upward.

In this report the term "abundance" is used in a somewhat narrow sense to mean the abundance of harvestable fish in the population. In other words, it equates to the supply of fish perceived by fishermen.

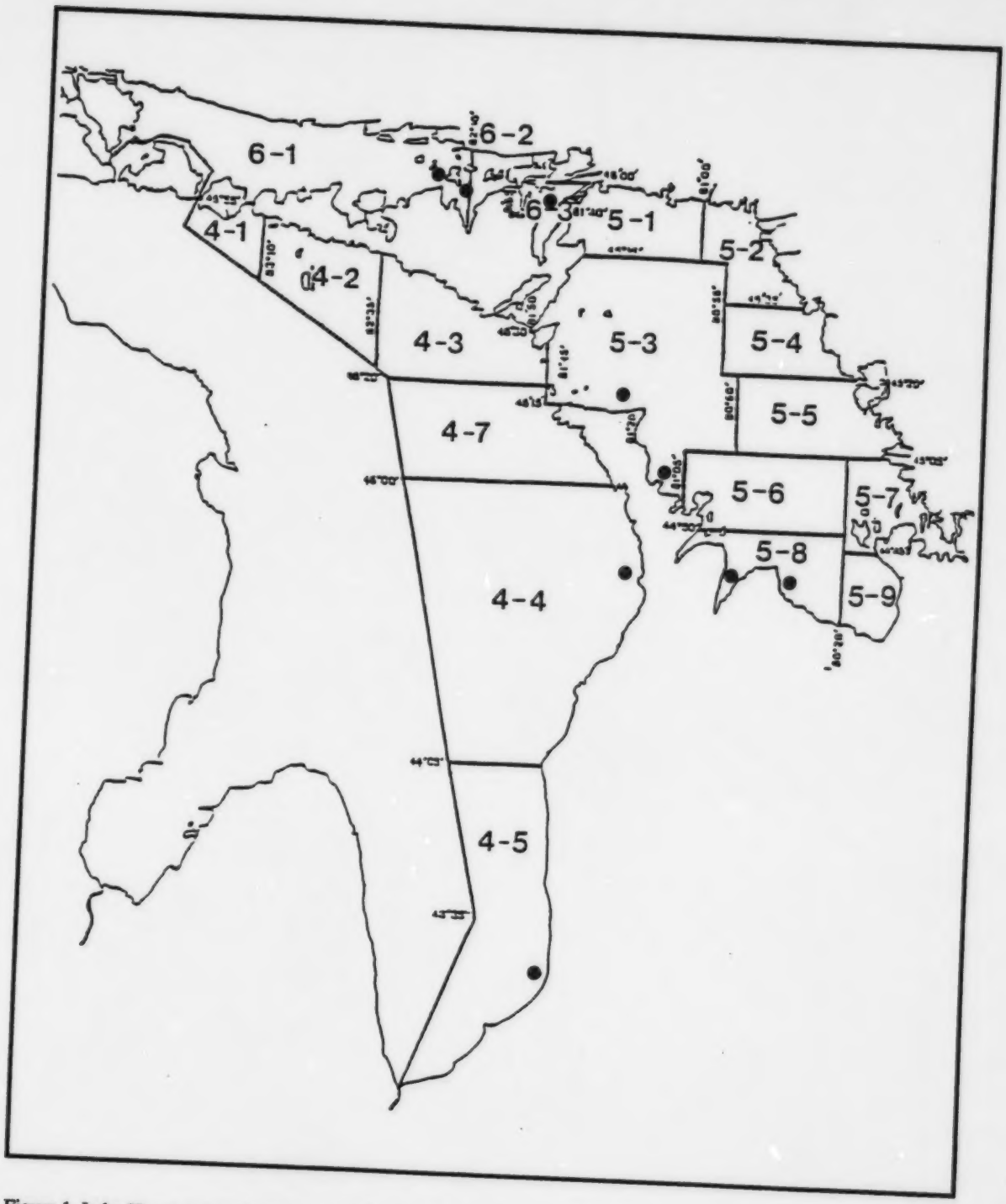

Figure 1. Lake Huron management areas. Index netting sites indicated by "●".

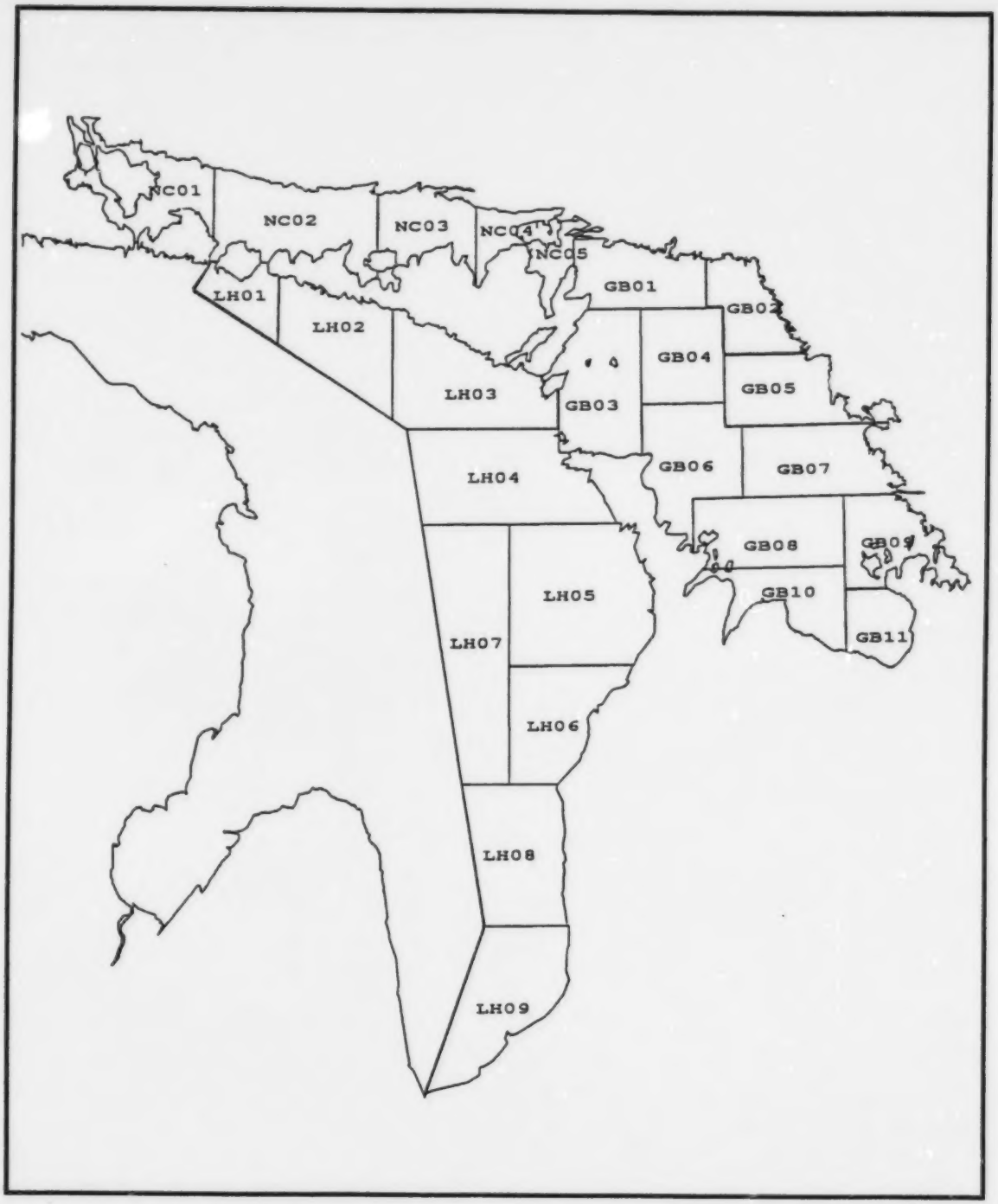

Figure 2. Lake Huron assessment areas.

MANAGEMENT AREA 4-1

GENERAL

- Harvest of all fish species under quota control decreased 4% to 51,830 kgs (Table 1). Value of these fish increased 1% to $121,157.
- Harvest and value of the non-quota species is given in Table 2.

Table 1. Value ($), round weight (kgs) and percent quota taken by quota species for management area 4-1 (LH01), 1990.

Species	Value ($)	Harvest kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	31	25	1287	1.9
Chub	50072	21814	22833	95.5
Lake Trout	3992	1533	1572	97.5
Lake Whitefish	66632	28356	71932	39.4
Northern Pike	0	0	0	
Pink Salmon	44	23	2046	1.1
Sturgeon	0	0	203	0.0
Walleye	386	79	519	15.2
Yellow Perch	0	0	50	0.0
Total	121157	51830		

Table 2. Value ($) and round weight (kgs) by non-quota species for management area 4-1 (LH01), 1990.

Species	Value ($)	Harvest (kgs)
Burbot	0	3496
Carp	138	157
Chinook Salmon	0	45
Lake Herring	32	35
Round Whitefish	134	289
Suckers	0	1314
Discarded (mixed)	0	517
Total	304	5853

LAKE WHITEFISH

- The allocation remained at 71,932 kgs.
- The harvest dropped 10% to 28,356 kgs, 39% of the allocation (Figure 3).
- Effort dropped 20% to 389 kms (Figure 4).
- CUE increased 13% to 73 kgs/km (Figure 5).
- Preliminary onboard catch sampling indicates that older aged fish (6 to 8) compensated to some degree for the weak 1985 year-class.
- Abundance increased slightly as predicted.
- Abundance will begin to increase in 1991 with the continued recruitment of the 1986 year-class as age 5 fish and the initial appearance of the strong 1987 year-class (Figure 31, page 29). Abundance should continue to increase in 1992.

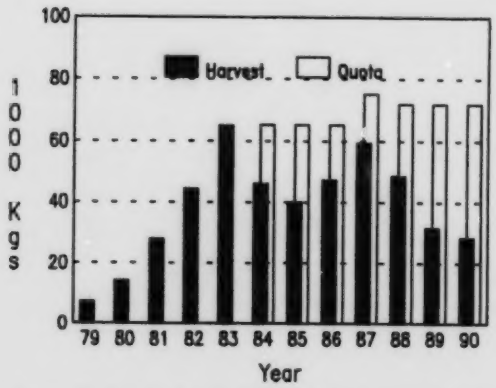

Figure 3. Lake whitefish harvest and quota in kilograms for management area 4-1 (LH01).

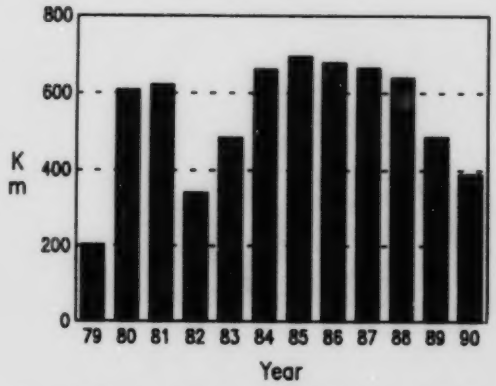

Figure 4. Lake whitefish annual gill net effort (km) for management area 4-1 (LH01).

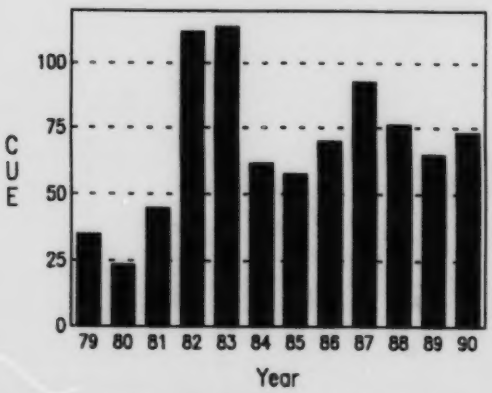

Figure 5. Lake whitefish annual gill net CUEs (kgs/km) for management area 4-1 (LH01).

CHUB

- Allocation increased 11% to 22,833 kgs.
- Harvest increased 7% to 21,814 kgs, 96% of the allocation (Figure 6).
- Effort remained virtually unchanged at 270 kms (Figure 8).
- CUE increased 5% to 80.9 kgs/kms (Figure 8).
- Yield increased slightly to 0.59 kgs/ha (Figure 9).
- Preliminary commercial catch sampling suggests an age structure similar to that of management area 4-2 chub.
- Abundance did remain high as predicted and should remain high through 1991. Abundance will begin to decline in 1992 as the weak 1985 through 1987 year-classes replace those strong year-classes currently in the fishery.

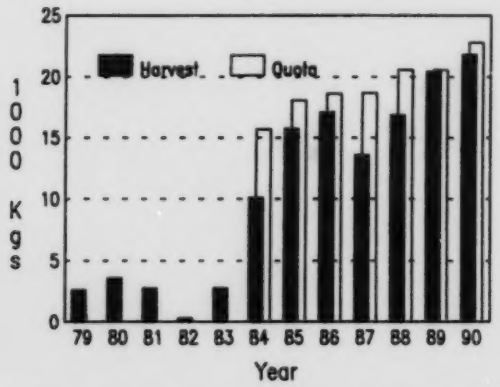

Figure 6. Chub harvest and quota in kilograms for management area 4-1 (LH01).

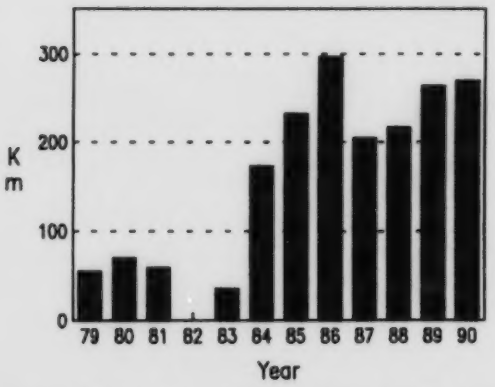

Figure 7. Chub annual gill net effort (km) for management area 4-1 (LH01).

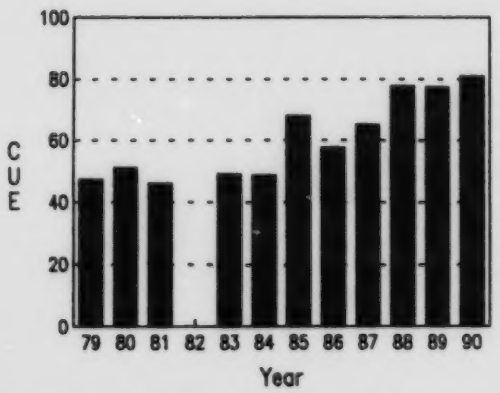

Figure 8. Chub annual gill net CUEs (kgs/km) for management area 4-1 (LH01).

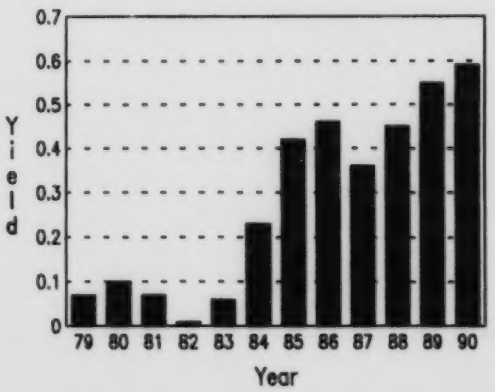

Figure 9. Chub yield (kgs/ha) for management area 4-1 (LH01).

MANAGEMENT AREA 4-2

GENERAL

- Harvest of all fish species under quota control decreased 22% to 107,841 kgs (Table 3). Value of these fish decreased 27% to $264,402.
- Harvest and value of the non-quota species is given in Table 4.

Table 3. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 4-2 (LH02), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	1797	2247	3106	72.3
Chub	114415	43129	43582	99.0
Lake Trout	2797	1101	1356	81.2
Lake Whitefish	144435	61178	153161	39.9
Northern Pike	15	5	129	3.9
Pink Salmon	0	0	1591	0.0
Sturgeon	612	78	357	21.8
Walleye	331	103	373	27.6
Yellow Perch	0	0	250	0.0
Total	264402	107841		

Table 4. Value ($) and round weight (kgs) by non-quota species for management area 4-2 (LH02), 1990.

Species	Value ($)	Harvest (kgs)
Burbot	0	317
Carp	303	361
Freshwater Drum	85	91
Lake Herring	82	92
Pacific Salmon	0	15
Rainbow Trout	0	3
Round Whitefish	51	110
Suckers	1019	919
Discarded (mixed)	0	8619
Total	1540	10527

LAKE WHITEFISH

- The allocation remained at 153,161 kgs.
- The harvest dropped 35% to 61,178 kgs, 40% of the allocation (Figure 10). The gill net fishery accounted for 70% of the harvest with the remainder coming out of the trap net fishery (Figure 11).
- Gill and trap net effort dropped 28% (678 kms) and 11% (203 net sets), respectively (Figure 12).
- CUE of harvestable fish in the gill and trap net fisheries dropped 16% (to 63 kgs/km) and 14% (to 91.0 kgs/net), respectively (Figure 13).
- The number of recruiting age 4 fish increased as predicted but failed to offset weak year-classes appearing as ages 5 and 6 (Tables 5,6,8,9). The strong showing of undersize age 3 fish in the trap net fishery (Table 7,10) is consistent with the predicted strength of the 1987 year-class (Figure 31, page 29).
- Abundance dropped in 1990 although expected to increase slightly. The weak 1985 year-class contributed less than expected.
- Abundance will increase substantially in 1991 with the entry of the strong 1987 year-class as age 4 fish. Although not fully recruited, these age 4 fish should dominate the catch. Age 6 fish will be scarce. Abundance should remain high in 1992.

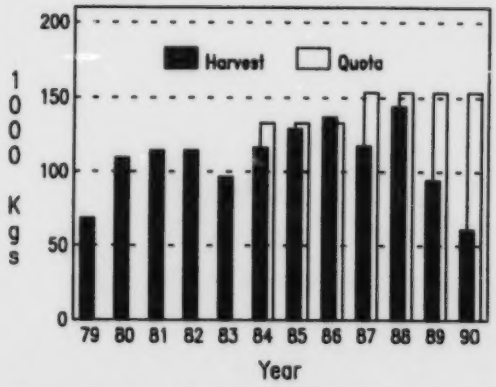

Figure 10. Lake whitefish harvest and quota in kilograms for management area 4-2 (LH02).

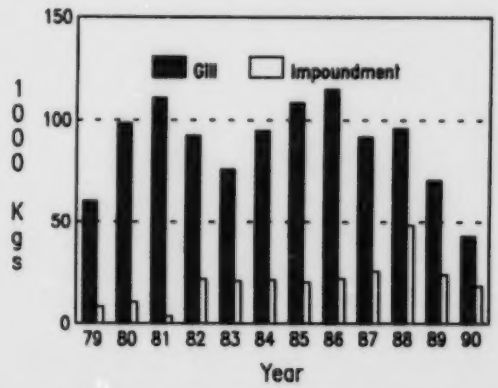

Figure 11. Lake whitefish harvest in kilograms for management area 4-2 (LH02).

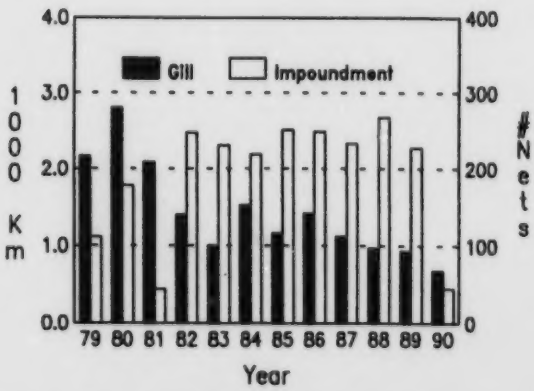

Figure 12. Annual effort for lake whitefish in management area 4-2 (LH02).

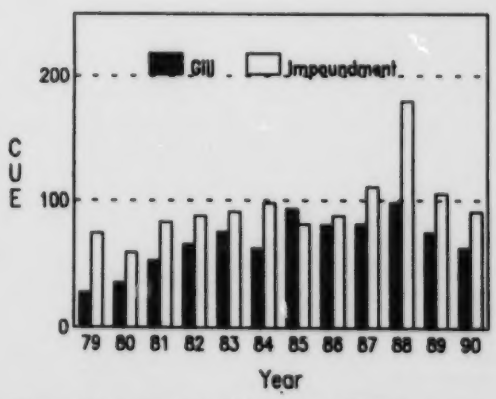

Figure 13. Lake whitefish annual CUEs for management area 4-2 (LH02).

Table 5. Age-class composition of lake whitefish caught in gill nets in management area 4-2 (LH02).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0		0	0	0	0	0	0
2	31	0	0	0	0		0	0	0	0	0	0
3	1366	6814	3549	159	0		541	981	0	0	1546	1027
4	22621	31813	67666	14508	5638	N	8423	39964	19443	5367	7533	12318
5	10942	21979	15416	45633	35376	O	61822	41661	33378	53462	17481	8100
6	4817	4444	3004	3647	12649		12463	11875	17924	15499	19117	6061
7	2348	2295	464	581	582	D	2405	1149	6460	1989	3220	3714
8	126	1515	605	581	0	A	861	215	801	1574	1131	1040
9	100	0	304	843	0	T	71	237	83	0	407	212
10	0	133	54	0	0	A	0	0	0	348	206	352
11	0	0	197	0	0		143	0	0	0	0	24
12	31	133	54	0	0		0	0	0	97	0	0
13	0	0	0	0	0		0	0	0	0	0	0
>13	0	133	0	0	0		0	0	0	0	0	0

Table 6. Age-class composition of harvested lake whitefish caught in trap nets in management area 4-2 (LH02).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	35	0
3	99	93	102	783	884	359	472	1097	2921
4	7487	7698	5485	4023	8917	12123	9505	2993	6486
5	7280	7154	10066	8759	7617	7402	22245	3952	2706
6	733	1471	3221	2544	2930	2703	5289	5176	1734
7	66	53	432	278	354	946	2074	2053	1230
8	78	0	20	247	67	208	575	505	540
9	117	111	20	0	0	26	0	143	125
10	115	35	20	0	41	44	0	0	23
11	0	146	0	0	0	0	177	26	27
12	0	18	0	0	0	26	50	0	0
13	0	0	0	43	0	0	0	0	0
>13	49	18	0	0	0	0	0	0	0

Table 7. Age-class composition of harvested and released lake whitefish caught in impoundment nets in management area 4-2 (LH02).

AGE	1986	1987	1988	1989	1990
1	70		514	0	48
2	1434		7749	1468	4619
3	19204		10652	3134	23624
4	16359	N	14774	3346	8616
5	8471	O	22729	4008	2706
6	3064		5471	5176	1734
7	354	D	2074	2053	1230
8	67	A	575	505	540
9	0	T	0	143	125
10	41	A	0	0	23
11	0		177	26	27
12	0		50	0	0
13	0		0	0	0
>13	0		0	0	0

Table 8. CUE-at-age (number/km) for lake whitefish caught in gill nets in management area 4-2 (LH02).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
2	0.01	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
3	0.63	2.43	1.70	0.11	0.00		0.47	0.69	0.00	0.00	1.65	1.52
4	10.43	11.35	32.40	10.33	5.62	N	7.24	28.03	17.30	5.51	8.04	18.17
5	5.05	7.84	7.38	32.48	35.25	O	53.17	29.22	29.70	54.84	18.65	11.95
6	2.22	1.58	1.44	2.60	12.60		10.72	8.33	15.95	15.90	20.39	8.94
7	1.08	0.82	0.22	0.41	0.58	D	2.07	0.81	5.75	2.04	3.43	5.48
8	0.06	0.54	0.29	0.41	0.00	A	0.74	0.15	0.71	1.61	1.21	1.53
9	0.05	0.00	0.15	0.60	0.00	T	0.06	0.17	0.07	0.00	0.43	0.31
10	0.00	0.05	0.03	0.00	0.00	A	0.00	0.00	0.00	0.36	0.22	0.52
11	0.00	0.00	0.09	0.00	0.00		0.12	0.00	0.00	0.00	0.00	0.04
12	0.01	0.05	0.03	0.00	0.00		0.00	0.00	0.00	0.10	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.05	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00

Table 9. CUE-at-age (number/net) for harvested lake whitefish caught in impoundment nets in management area 4-2 (LH02).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00
3	0.40	0.40	0.47	3.12	3.55	1.54	1.76	4.81	14.39
4	30.31	33.32	25.05	16.03	35.81	52.03	35.47	13.13	31.95
5	29.47	30.97	45.96	34.90	30.59	31.77	83.00	17.33	13.33
6	2.97	6.37	14.71	10.14	11.77	11.60	19.74	22.70	8.54
7	0.27	0.23	1.97	1.11	1.42	4.06	7.74	9.00	6.06
8	0.32	0.00	0.09	0.98	0.27	0.89	2.15	2.21	2.66
9	0.47	0.48	0.09	0.00	0.00	0.11	0.00	0.63	0.61
10	0.47	0.15	0.09	0.00	0.16	0.19	0.00	0.00	0.11
11	0.00	0.63	0.00	0.00	0.00	0.00	0.66	0.11	0.13
12	0.00	0.08	0.00	0.00	0.00	0.11	0.19	0.00	0.00
13	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
>13	0.20	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 10. CUE-at-age (number/net) for harvested and released lake whitefish caught in impoundment nets in management area 4-2 (LH02).

AGE	1986	1987	1988	1989	1990
1	0.3		1.9	0.0	0.2
2	5.8		28.9	6.4	22.8
3	77.1		39.7	13.7	116.4
4	65.7	N	55.1	14.7	42.4
5	34.0	O	84.8	17.6	13.3
6	12.3		20.4	22.7	8.5
7	1.4	D	7.7	9.0	6.1
8	0.3	A	2.1	2.2	2.7
9	0.0	T	0.0	0.6	0.6
10	0.2	A	0.0	0.0	0.1
11	0.0		0.7	0.1	0.1
12	0.0		0.2	0.0	0.0
13	0.0		0.0	0.0	0.0
>13	0.0		0.0	0.0	0.0

CHUB

- Allocation increased 11% to 43,582 kgs.
- Harvest increased 10% to 43,129 kgs, 99% of the allocation (Figure 14).
- Effort decreased 26% to 317 kms (Figure 15).
- CUE increased 50% to 136 kgs/kms (Figure 16). Limited discarding (Figure 17).
- Yield increased slightly to 0.58 kgs/ha (Figure 18).
- The strong year-classes from 1982 to 1984 (ages 6,7,8) continue to support the fishery (Table 11). The slower growth of these large year-classes is such that recruitment to the fishery is still occurring at age 8 (Table 12). The poor contribution of the 1985 through 1987 year-classes in commercial gear confirms the weakness predicted from index fishing in assessment area LH05 (Figure 38, page 33).
- The increase in abundance was the result of continued recruitment of the 1983 and 1984 year-classes rather than the initial appearance of the succeeding year-classes. This is in sharp contrast to the early 80s when the fishery was highly dependent on those year-classes recruiting for the first time.
- Abundance should remain relatively constant in 1991 on the strength of the contributions of the 1982 through 1984 year-classes. But the weak 1985 through 1987 year-classes will begin to depress abundance in 1992. The large 1988 year-class (Figure 38, page 33) will not have much effect on abundance until 1993.

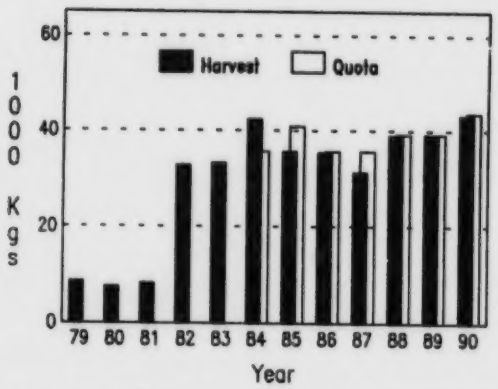

Figure 14. Chub harvest and quota in kilograms for management area 4-2 (LH02).

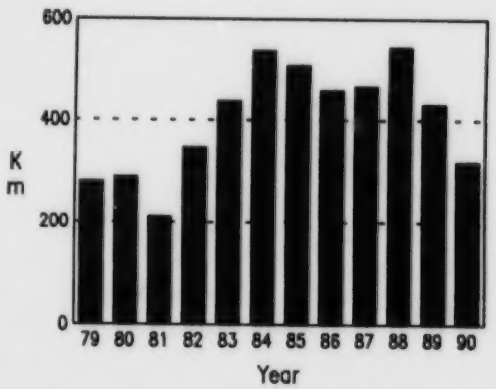

Figure 15. Chub annual gill net effort (km) for management area 4-2 (LH02).

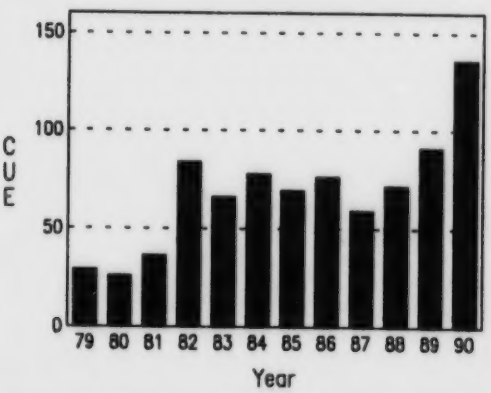

Figure 16. Chub annual gill net CUEs (kgs/km) for management area 4-2 (LH02).

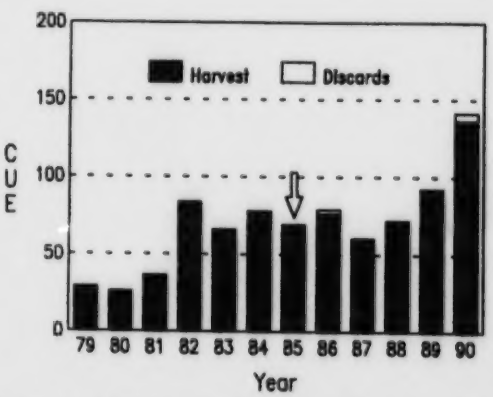

Figure 17. Chub annual gill net CUES (kgs/km) (harvest + discards) for management area 4-2 (LH02).

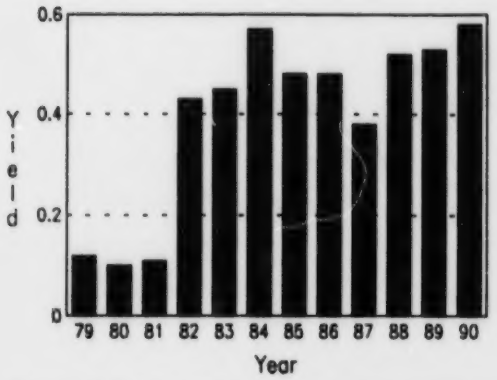

Figure 18. Chub yield (kgs/ha) for management area 4-2 (LH02).

Table 11. Age-class composition of chub caught in gill nets in management area 4-2 (LH02).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0	0	0	93
2	272	0	0	0	0	0	0	0	41	0	23	931
3	195	2616	1164	0	1648	0	448	491	786	231	227	428
4	2838	3151	19665	31040	17128	11187	3125	6227	6785	1863	172	664
5	4560	3658	5713	76945	66859	23422	47056	23367	20994	33715	9598	11731
6	13394	7450	3520	10632	49921	112315	44152	58124	38157	63111	61395	47249
7	5512	8665	2329	5907	4150	42223	59211	45853	50686	58561	63761	82831
8	2146	1763	3688	8093	3028	2932	14192	29792	26742	24246	43697	53111
9	1002	501	939	9973	1599	1120	4700	5655	6143	6799	15810	9320
10	599	140	385	1331	1490	0	89	0	440	1497	4630	3564
11	154	0	48	330	109	0	589	0	60	312	379	0
12	0	140	0	0	0	0	89	341	0	0	0	0
13	250	0	0	0	0	0	52	0	0	0	0	0
>13	77	0	0	0	109	0	0	0	0	0	0	0

Note: corrected for discarding 1987 onward.

Table 12. CUE-at-age (number/km) for chub caught in gill nets in management area 4-2 (LH02).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
2	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.05	2.94
3	0.70	9.11	5.54	0.00	3.77	0.00	0.88	1.07	1.68	0.42	0.53	1.35
4	10.21	10.98	93.60	89.97	39.19	20.83	6.15	13.58	14.54	3.42	0.40	2.09
5	16.41	12.75	27.19	223.03	153.00	43.62	92.67	50.96	44.99	61.98	22.26	36.99
6	48.20	25.96	16.75	30.82	114.24	209.15	86.95	126.77	81.78	116.01	142.41	149.00
7	19.83	30.19	11.09	17.12	9.50	78.63	116.60	100.01	108.63	107.65	147.90	261.21
8	7.72	6.14	17.55	23.46	6.93	5.46	27.95	64.98	57.31	44.57	101.36	167.49
9	3.61	1.75	4.47	28.91	3.66	2.09	9.26	12.33	13.17	12.50	36.67	29.39
10	2.16	0.49	1.83	3.86	3.41	0.00	0.18	0.00	0.94	2.75	10.74	11.24
11	0.55	0.00	0.23	0.96	0.25	0.00	1.16	0.00	0.13	0.57	0.88	0.00
12	0.00	0.49	0.00	0.00	0.00	0.00	0.18	0.74	0.00	0.00	0.00	0.00
13	0.90	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
>13	0.28	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1987 onward.

MANAGEMENT AREA 4-3

GENERAL

- Harvest of all fish species under quota control decreased 1% to 118,573 kgs (Table 13). Value of these fish increased 2% to $282,727.
- Harvest and value of the non-quota species is given in Table 14.

Table 13. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 4-3 (LH03), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	558	639	4153	15.4
Chub	116525	45152	65751	68.7
Lake Trout	7588	3043	1707	178.3
Lake Whitefish	157346	69483	88263	78.7
Northern Pike	394	161	838	19.2
Pink Salmon	0	0	1547	0.0
Sturgeon	0	0	244	0.0
Walleye	291	88	750	11.7
Yellow Perch	25	7	2943	0.2
Total	282727	118573		

Table 14. Value ($) and round weight (kgs) by non-quota species for management area 4-3 (LH03), 1990.

Species	Value ($)	Harvest (kgs)
Burbot	0	13361
Carp	498	850
Chinook Salmon	0	6
Lake Herring	351	479
Pacific Salmon	0	7
Rainbow Smelt	0	110
Rainbow Trout	0	122
Round Whitefish	231	316
Suckers	1373	11653
White Bass	0	21
Discarded (mixed)	0	4560
Total	2453	31485

LAKE WHITEFISH

- The allocation dropped 10% to 88,263 kgs, apparently a result of a reduction in licences.
- The harvest rose 7% to 69,483 kgs, 79% of the allocation (Figure 19).
- Gill net effort rose 15% to 953 kms (Figure 20).
- CUE decreased 8% to 71 kgs/km (Figure 21).
- The number of recruiting age 4 fish increased as predicted but failed to offset weak year-classes appearing as ages 5 and 6 (Tables 15,16).
- Abundance dropped in 1990 although expected to increase slightly. This resulted from weaker 1984 and 1985 year-classes.
- Abundance will increase substantially in 1991 with the entry of the strong 1987 year-class as age 4 fish (Figure 31, page 29). Although not fully recruited, these age 4 fish should dominate the catch. Abundance should remain high in 1992.

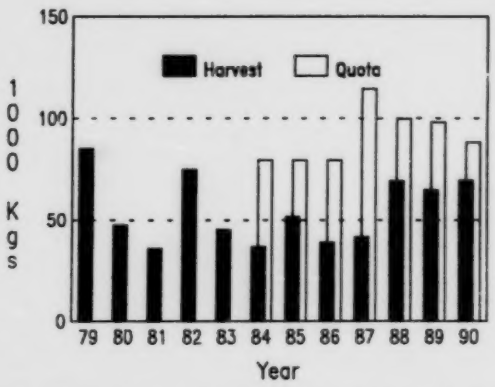

Figure 19. Lake whitefish harvest and quota in kilograms for management area 4-3 (LH03).

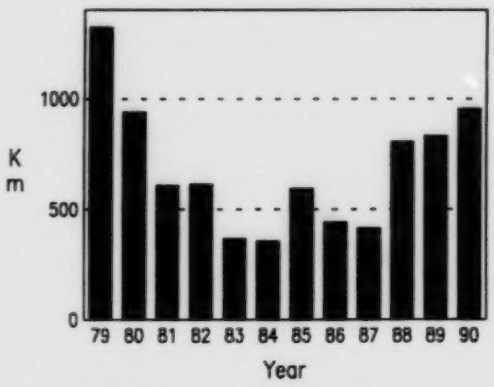

Figure 20. Lake whitefish annual gill net effort (km) for management area 4-3 (LH03).

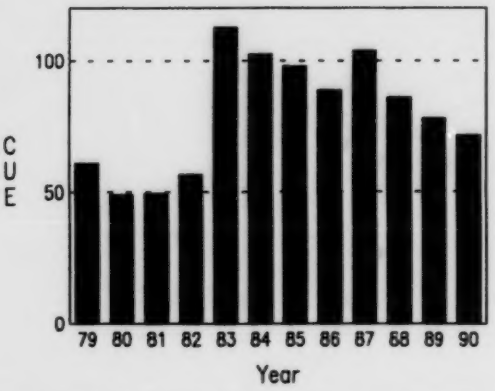

Figure 21. Lake whitefish annual gill net CUEs (kgs/km) for management area 4-3 (LH03).

Table 15. Age-class composition of lake whitefish harvested in gill nets in management area 4-3 (LH03).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0		0	0	0		0	0	0
2	167	0	0	0		0	0	0		0	0	0
3	5787	5851	84	766		569	365	52		163	231	428
4	31496	12626	19693	10699	N	16359	5231	7915	N	5287	5805	14340
5	13142	12671	3428	14998	O	10448	24562	8621	O	22619	12722	11269
6	4995	2470	3426	957		1559	7433	5053		16525	15430	7915
7	3222	1165	678	326	D	1080	2265	2254	D	3064	6422	4474
8	504	938	367	49	A	0	2260	935	A	658	1384	4514
9	323	96	395	126	T	71	68	1233	T	123	579	1063
10	96	0	114	49	A	0	0	86	A	172	250	331
11	72	72	0	0		0	0	52		93	0	248
12	0	0	0	0		0	0	0		0	0	152
13	0	72	0	0		0	0	0		0	0	124
>13	0	0	0	0		0	0	0		0	0	0

Table 16. CUE-at-age (number/km) for lake whitefish harvested in gill nets in management area 4-3 (LH03).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00
2	0.13	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00
3	4.38	6.25	0.14	1.25		1.60	0.62	0.12		0.20	0.28	0.45
4	23.86	13.49	32.37	17.46	N	46.04	8.82	18.01	N	6.57	6.98	15.05
5	9.95	13.54	5.63	24.48	O	29.41	41.43	19.62	O	28.09	15.30	11.82
6	3.78	2.64	5.63	1.56		4.39	12.54	11.50		20.53	18.55	8.31
7	2.44	1.24	1.11	0.53	D	3.04	3.82	5.13	D	3.81	7.72	4.69
8	0.38	1.00	0.60	0.08	A	0.00	3.81	2.13	A	0.82	1.66	4.74
9	0.24	0.10	0.65	0.21	T	0.20	0.11	2.81	T	0.15	0.70	1.12
10	0.07	0.00	0.19	0.08	A	0.00	0.00	0.20	A	0.21	0.30	0.35
11	0.05	0.08	0.00	0.00		0.00	0.00	0.12		0.12	0.00	0.26
12	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.16
13	0.00	0.08	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.13
>13	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00

CHUB

- Allocation increased 10% to 65,751 kgs.
- Harvest decreased 14% to 45,152 kgs, 69% of the allocation (Figure 22).
- Effort decreased 27% to 429 kms (Figure 23).
- CUE increased 18.9% to 105 kgs/kms (Figure 24). Limited discarding (Figure 25).
- Yield decreased to 0.44 kgs/ha (Figure 26).
- The strong year-classes from 1982 to 1984 (ages 6,7,8) continue to support the fishery (Table 17). The slower growth of these large year-classes is such that recruitment to the fishery is still occurring at age 8 (Table 18). The poor contribution of the 1985 through 1987 year-classes in commercial gear confirms the weakness predicted from index fishing in assessment area LH05 (Figure 38, page 33).
- The increase in abundance was the result of continued recruitment of the 1983 and 1984 year-classes rather than the initial appearance of the succeeding year-classes.
- Abundance should remain relatively constant in 1991 on the strength of the contributions of the 1982 through 1984 year-classes. But the weak 1985 through 1987 year-classes will begin to depress abundance in 1992. The large 1988 year-class (Figure 38, page 33) will not have much effect on abundance until 1993.

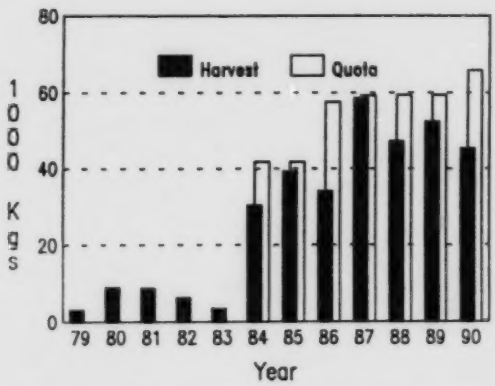

Figure 22. Chub harvest and quota in kilograms for management area 4-3 (LH03).

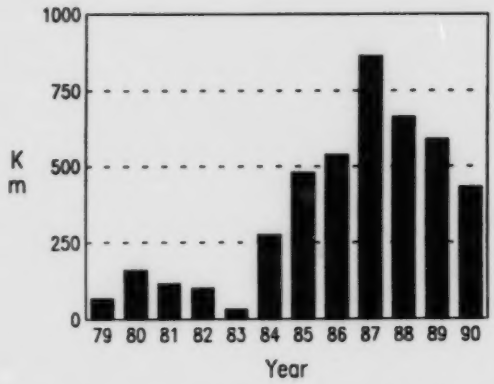

Figure 23. Chub annual gill net effort (km) for management area 4-3 (LH03).

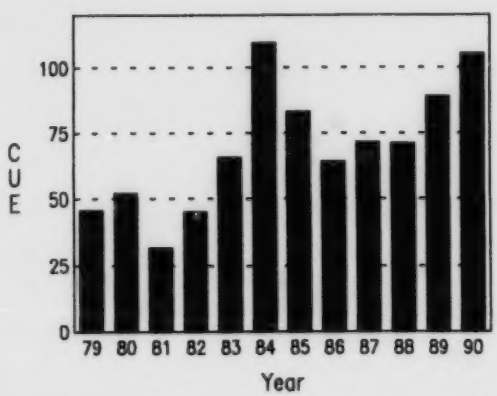

Figure 24. Chub annual gill net CUEs (kgs/km) for management area 4-3 (LH03).

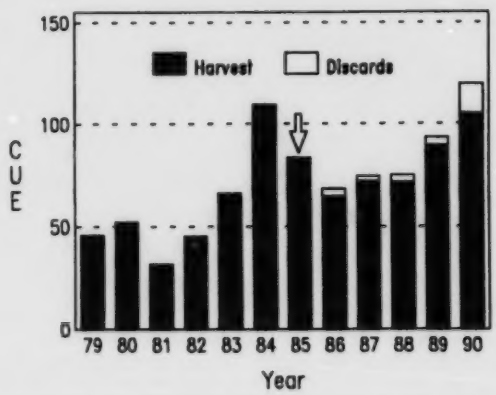

Figure 25. Chub annual gill net CUEs (kgs/km) (harvest + discards) for management area 4-3 (LH03).

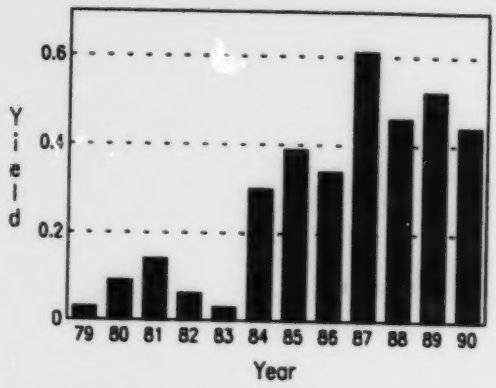

Figure 26. Chub yield (kgs/ha) for management area 4-3 (LH03).

Table 17. Age-class composition of chub caught in gill nets in management area 4-3 (LH03).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0				0	0	0		0	0	0
2	0	148				0	0	0		0	0	2320
3	48	6797				0	0	663		179	0	0
4	702	7535	N	N	N	34179	2417	11925	N	9743	746	737
5	1083	5642	O	O	O	53140	31947	19555	O	70016	22137	10268
6	6016	7266				47162	28788	53775		77769	90033	47434
7	2397	8608	D	D	D	14634	78721	47403	D	62998	88014	94890
8	1049	2558	A	A	A	584	38269	27383	A	30239	38208	62466
9	635	641	T	T	T	0	1315	8115	T	6393	8429	19470
10	567	360	A	A	A	3160	3044	766	A	480	4150	2003
11	116	212				2576	0	536		0	298	0
12	150	0				2576	0	0		0	0	0
13	82	0				0	0	0		0	0	0
>13	164	0				0	0	0		0	0	501

Note: corrected for discards 1988 onward.

Table 18. CUE-at-age (number/km) for chub caught in gill nets in management area 4-3 (LH03).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00				0.00	0.00	0.00		0.00	0.00	0.00
2	0.00	0.93				0.00	0.00	0.00		0.00	0.00	5.41
3	0.69	42.59				0.00	0.00	1.24		0.27	0.00	0.00
4	10.12	47.21	N	N	N	124.38	5.05	22.21	N	14.71	1.27	1.72
5	15.61	35.35	O	O	O	193.38	66.71	36.43	O	105.68	37.72	23.94
6	86.69	45.53				171.62	60.11	100.18		117.39	153.40	110.57
7	34.54	53.93	D	D	D	53.25	164.38	88.31	D	95.09	149.96	221.19
8	15.12	16.03	A	A	A	2.13	79.91	51.01	A	45.64	65.10	145.61
9	9.15	4.02	T	T	T	0.00	2.75	15.12	T	9.65	14.36	45.39
10	8.17	2.26	A	A	A	11.50	6.36	1.43	A	0.72	7.07	4.67
11	1.67	1.33				9.37	0.00	1.00		0.00	0.51	0.00
12	2.16	0.00				9.37	0.00	0.00		0.00	0.00	0.00
13	1.18	0.00				0.00	0.00	0.00		0.00	0.00	0.00
>13	2.36	0.00				0.00	0.00	0.00		0.00	0.00	1.17

Note: corrected for discards 1988 onward.

MANAGEMENT AREA 4-4

GENERAL

- Harvest of all fish species under quota control increased 20% to 567,177 kgs (Table 19). Value of these fish increased 25% to $1,344,651.
- Harvest and value of the non-quota species is given in Table 20.

Table 19. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 4-4 (LH05, LH06, LH07), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	823	864	unlimited	n/a
Chub	389126	186226	257211	72.4
Lake Trout	4169	1625	1582	102.7
Lake Whitefish	892727	363812	360244	101.0
Northern Pike	69	71	393	18.1
Pink Salmon	0	0	1456	0.0
Sturgeon	0	0	100	0.0
Walleye	5499	2321	742	314.2
Yellow Perch	52238	12258	18327	66.9
Total	1344651	567177		

Table 20. Value ($) and round weight (kgs) by non-quota species for management area 4-4 (LH05, LH06, LH07), 1990.

Species	Value ($)	Harvest (kgs)
Burbot	10	35
Carp	0	136
Freshwater Drum	16	58
Gizzard Shad	0	91
Lake Herring	30	35
Rainbow Smelt	1	1
Round Whitefish	38	53
Suckers	0	68
White Bass	396	332
Total	491	809

LAKE WHITEFISH

- The allocation rose 10% to 360,244 kgs.
- The harvest rose 14% to 363,812 kgs, 101% of the allocation (Figure 27). Most of the harvest occurred in LH05 (91%) (Figure 28).
- Gill net effort dropped 7% to 1258 kms (Figure 29).
- CUE in assessment area LH05 increased 23% to 288 kgs/km (Figure 30).
- Age 4 and 5 fish continue to dominate the fishery (Tables 21,22).
- Abundance increased as predicted in 1990 as the strong 1986 year-class entered the fishery.
- Abundance will increase substantially in 1991 with the entry of the even stronger 1987 year-class as age 4 fish (Figure 31, page 29). Abundance will remain high in 1992.

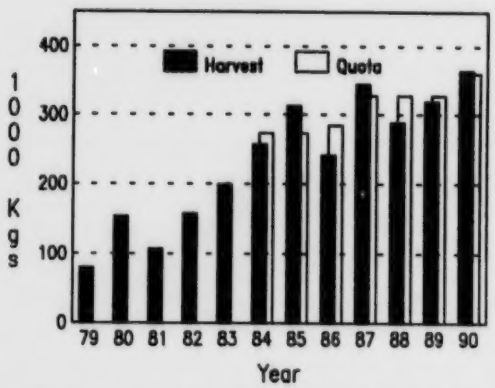

Figure 27. Lake whitefish harvest and quota in kilograms for management area 4-4 (LH05, LH06, LH07).

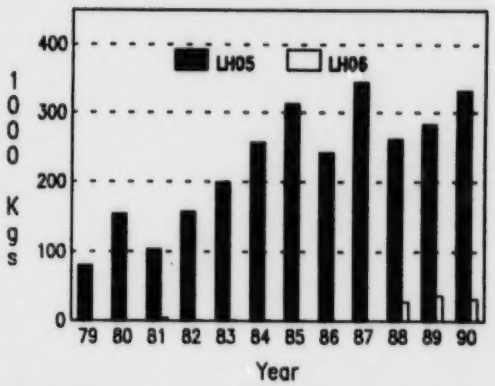

Figure 28. Lake whitefish harvest in kilograms for management area 4-4 (LH05, LH06, LH07).

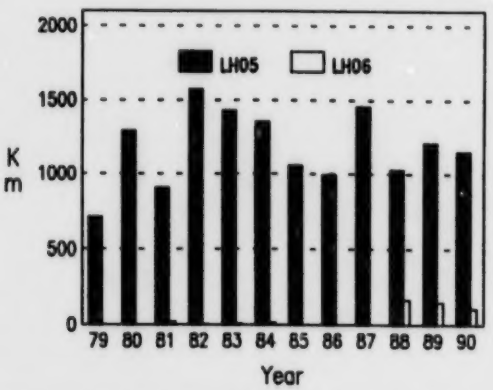

Figure 29. Lake whitefish gill net effort (km) for management area 4-4 (LH05, LH06, LH07).

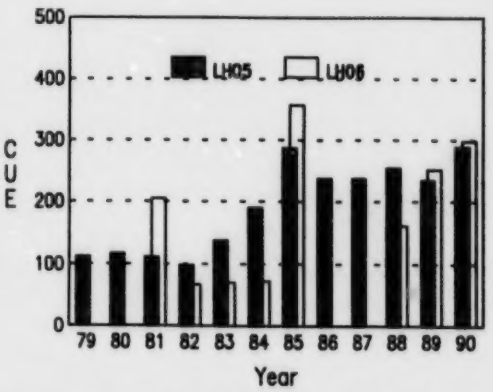

Figure 30. Lake whitefish annual gill net CUEs (kgs/km) for management area 4-4 (LH05,LH06, LH07).

Table 21. Age-class composition of lake whitefish harvested in gill nets in assessment area LH05 (subarea of management area 4-4).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0		0	100	0	0	0	0	0	0	0
2	5729	1996		3365	511	0	212	0	0	0	0	0
3	4530	110787		72799	44881	17847	27917	6782	12432	16471	4313	6620
4	38415	7457	N	34437	106749	155251	165081	93226	117690	78137	150873	129856
5	7828	13549	O	23516	10738	27976	47013	70423	82364	42774	36958	95058
6	1672	4066		1889	6218	6096	4349	10833	34697	19099	9123	20719
7	1575	769	D	165	203	5236	888	2950	9769	9385	7926	9605
8	584	687	A	485	0	0	1962	1281	1371	2995	1701	8490
9	381	253	T	165	411	982	193	804	228	1035	2722	5168
10	54	461	A	847	203	463	193	206	367	445	794	372
11	181	0		0	0	0	0	0	0	0	0	0
12	0	0		362	308	0	0	0	0	155	0	0
13	0	0		0	0	0	0	0	0	0	0	1103
>13	0	0		0	0	0	0	0	0	0	0	0

Table 22. CUE-at-age (number/km) for lake whitefish harvested in gill nets in assessment area LH05 (subarea of management area 4-4).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00		0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	8.02	1.55		2.14	0.36	0.00	0.20	0.00	0.00	0.00	0.00	0.00
3	6.34	85.83		46.28	31.45	13.22	26.50	6.84	8.54	16.01	3.56	5.75
4	53.80	5.78	N	21.89	74.80	115.03	156.70	93.98	80.81	75.93	124.69	112.73
5	10.96	10.50	O	14.95	7.52	20.73	44.63	70.99	56.55	41.57	30.54	82.52
6	2.34	3.15		1.20	4.36	4.52	4.13	10.92	23.82	18.56	7.54	17.99
7	2.21	0.60	D	0.10	0.14	3.88	0.84	2.97	6.71	9.12	6.55	8.34
8	0.82	0.53	A	0.31	0.00	0.00	1.86	1.29	0.94	2.91	1.41	7.37
9	0.53	0.20	T	0.10	0.29	0.73	0.18	0.81	0.16	1.01	2.25	4.49
10	0.08	0.36	A	0.54	0.14	0.34	0.18	0.21	0.25	0.43	0.66	0.32
11	0.25	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00		0.23	0.22	0.00	0.00	0.00	0.00	0.15	0.00	0.00
13	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96
>13	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

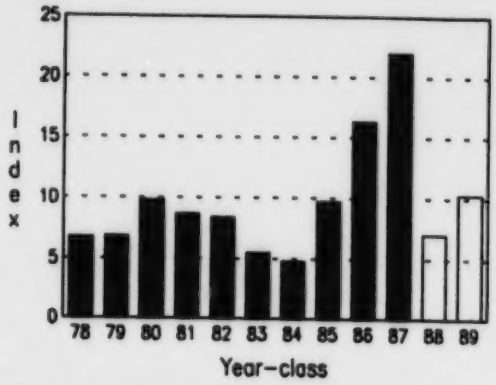

Figure 31. Indices of year-class strength for lake whitefish from index gillnetting in assessment area LH05 (subarea of management area 4-4).

CHUB

- Allocation increased 10% to 257,211 kgs.
- Harvest increased 34% to 186,226 kgs, 72% of the allocation (Figure 32).
- Effort decreased 8% to 939 kms (Figure 34).
- CUE of harvested fish increased 45% (Figure 35). An additional 18 kgs/km of small fish were discarded (Figure 36).
- Yield is variable across assessment areas (0.38 to 0.82 kgs/ha) (Figure 37).
- The strong year-classes from 1982 to 1984 (ages 6,7,8) continue to support the fishery (Tables 23, 24). The slower growth of these large year-classes is such that recruitment to the fishery is still occurring at ages 6 to 8 (Tables 25,26). The poor contribution of the 1985 through 1987 year-classes in commercial gear confirms the weakness predicted from index fishing (Figure 38, page 33).
- The increase in abundance was the result of continued recruitment of the 1983 and 1984 year-classes rather than the initial appearance of the succeeding year-classes.
- Abundance will remain high in 1991 on the strength of the contributions of the 1982 through 1984 year-classes. But the weak 1985 through 1987 year-classes should begin to depress abundance in 1992. The large 1988 year-class will not have much effect on abundance until 1993.

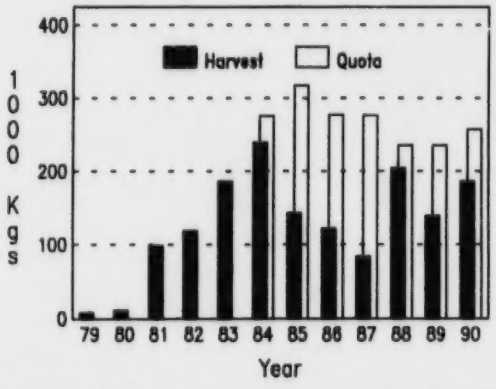

Figure 32. Chub harvest and quota in kilograms for management area 4-4 (LH05, LH06, LH07).

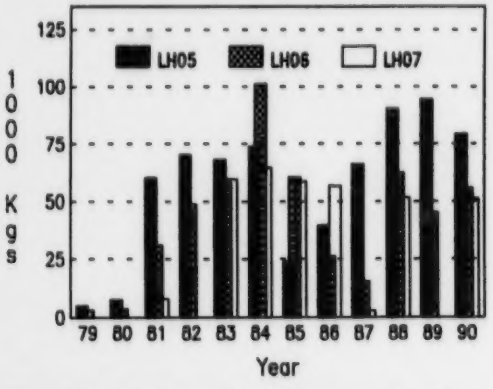

Figure 33. Chub harvest in kilograms for management area 4-4 (LH05, LH06, LH07).

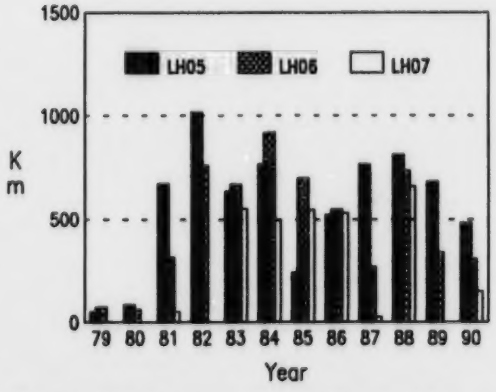

Figure 34. Chub annual gill net effort (km) by area for management area 4-4 (LH05, LH06, LH07).

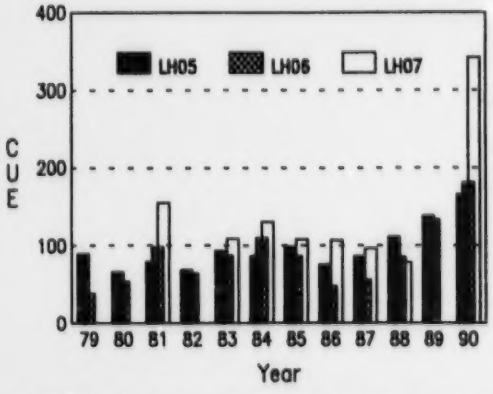

Figure 35. Chub annual gill net CUEs (kgs/km) by area for management area 4-4 (LH05, LH06, LH07).

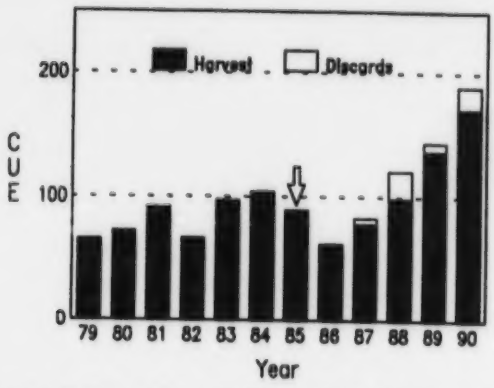

Figure 36. Chub gill net CUEs (kgs/km) (harvest + discards) for management area 4-4 (LH05,LH06).

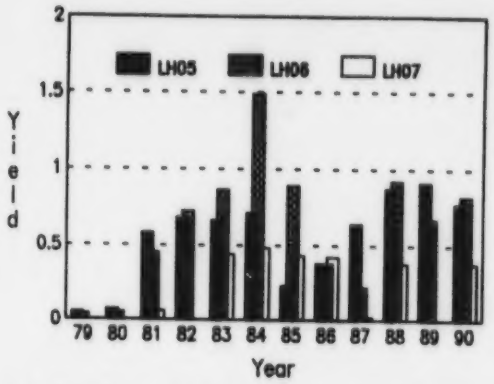

Figure 37. Chub yield (kgs/ha) for management area 4-4 (LH05, LH06, LH07).

Table 23. Age-class composition of chub caught in gill nets in assessment area LH05 (subarea of management area 4-4).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	473	0	0	0	0	0	0	0	0	1383
3	0	22404	34215	4779	2796	4309	8016	1443	4854	22957	726	0
4	0	7755	279792	86986	20480	41674	25245	25039	25413	119011	1568	0
5	0	8617	18361	262116	196207	80006	35893	34221	119588	252048	117513	22806
6	0	2585	473	11385	159715	143749	17229	96928	100968	200703	272661	171302
7	0	1724	3286	2344	0	112698	26561	38082	101177	88463	81690	121108
8	0	0	2144	0	0	4474	6700	13793	32762	14512	21952	75496
9	0	0	473	0	0	1348	0	3250	7169	2286	0	8379
10	0	0	473	0	0	0	0	0	1926	1250	0	0
11	0	0	0	0	0	0	0	0	0	0	0	2332
12	0	0	0	0	0	0	0	0	0	0	0	2332
13	0	0	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0	0	0	0	0

Note: corrected for discards 1987 onward.

Table 24. Age-class composition of chub caught in gill nets in assessment area LH06 (subarea of management area 4-4).

AGE	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0
2	756	0	0	0	0	0	0	0
3	12084	0	5948	1312	391	0	0	0
4	31441	51418	28402	30528	11282	13710	3470	287
5	96763	156175	119842	26664	27564	85853	57901	14660
6	141220	177427	81161	44601	20633	153753	106405	84791
7	8000	106401	50210	21129	7955	35908	50441	98468
8	2989	11518	14728	7517	11590	27421	12562	50325
9	1493	4799	1957	2199	1977	8487	5947	10531
10	804	6719	116	0	0	0	1101	3038
11	0	0	0	0	0	653	0	1452
12	756	0	0	0	268	980	0	0
13	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0

Note: corrected for discards 1989 onward.

Table 25. CUE-at-age (number/km) for chub caught in gill nets in assessment area LH05 (subarea of management area 4-4).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2		0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.88
3		257.52	51.00	4.69	4.43	5.66	33.26	2.77	6.35	28.34	1.07	0.00
4	N	89.14	417.04	85.41	32.45	54.73	104.75	48.00	33.27	146.91	2.30	0.00
5	O	99.05	27.37	257.35	310.90	105.08	148.93	65.60	156.55	311.13	172.41	47.46
6		29.71	0.71	11.18	253.07	188.80	71.49	185.79	132.17	247.75	400.03	356.51
7	D	19.82	4.90	2.30	0.00	148.01	110.21	73.00	132.45	109.20	119.85	252.05
8	A	0.00	3.20	0.00	0.00	5.88	27.80	26.44	42.89	17.91	32.21	157.12
9	T	0.00	0.71	0.00	0.00	1.77	0.00	6.23	9.38	2.82	0.00	17.44
10	A	0.00	0.71	0.00	0.00	0.00	0.00	0.00	2.52	1.54	0.00	0.00
11		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.85
12		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.85
13		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1987 onward.

Table 26. CUE-at-age (number/km) for chub caught in gill nets in assessment area LH06 (subarea of management area 4-4).

AGE	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	18.12	0.00	8.54	2.40	1.45	0.00	0.00	0.00
4	47.14	56.00	40.80	55.90	41.97	18.66	10.28	0.93
5	145.07	170.11	172.16	48.83	102.54	116.82	171.61	47.57
6	211.72	193.25	116.59	81.67	76.76	209.22	315.37	275.12
7	11.99	115.89	72.13	38.69	29.59	48.86	149.50	319.49
8	4.48	12.55	21.16	13.76	43.12	37.31	37.23	163.29
9	2.24	5.23	2.81	4.03	7.35	11.55	17.63	34.17
10	1.21	7.32	0.17	0.00	0.00	0.00	3.26	9.86
11	0.00	0.00	0.00	0.00	0.00	0.89	0.00	4.71
12	1.13	0.00	0.00	0.00	1.00	1.33	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1989 onward.

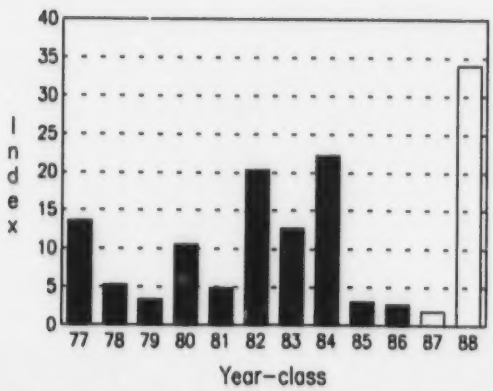

Figure 38. Indices of year-class strength for chub from index gillnetting in assessment area LH05 (subarea of management are 4-4).

YELLOW PERCH

- Allocation remained at 18,327 kgs.
- Harvest increased 14% to 12,258 kgs, 67% of the allocation (Figure 39). Most of the harvest came from LH05 (Figure 40).
- Effort increased 13% to 294 kms (Figure 41).
- CUE increased slightly (Figure 42).
- No age composition data.
- Abundance did not change significantly from 1989.
- Although the strong 1986 and 1987 year-classes will increase abundance at some point (Figure 43), without age composition data we can not predict exactly when.

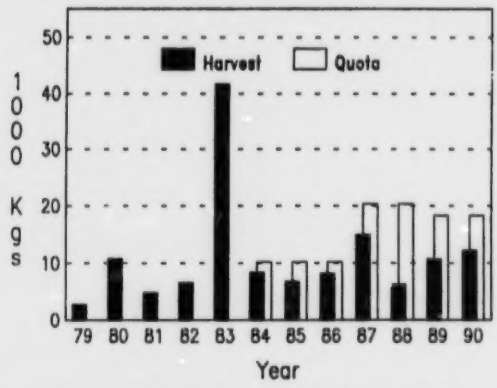

Figure 39. Yellow perch harvest and quota in kilograms for management area 4-4 (LH05, LH06, LH07).

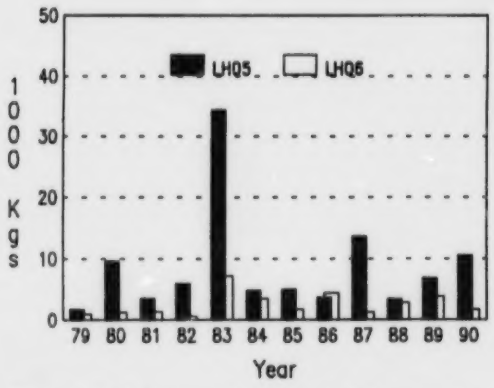

Figure 40. Yellow perch harvest in kilograms for management area 4-4 (LH05, LH06, LH07).

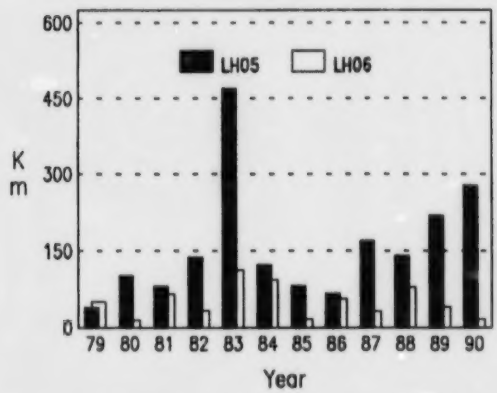

Figure 41. Yellow perch annual gill net effort (km) for management area 4-4 (LH05, LH06, LH07).

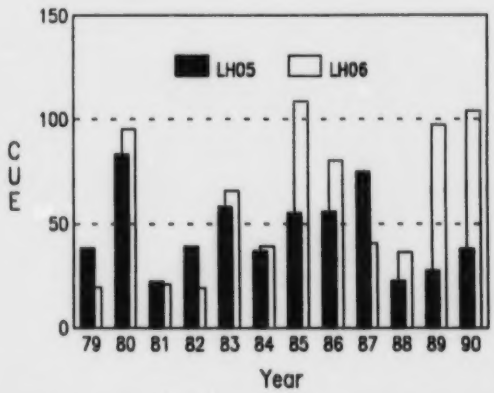

Figure 42. Yellow perch annual gill net CUEs (kgs/km) for management area 4-4 (LH05, LH06, LH07).

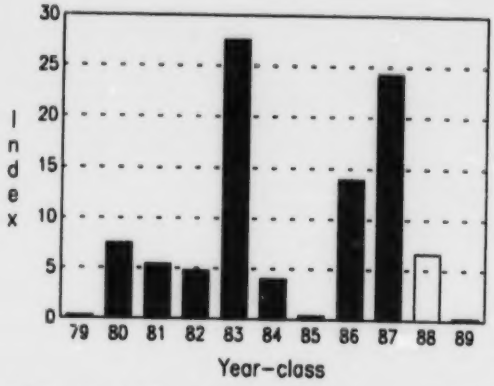

Figure 43. Indices of year-class strength for yellow perch from index gillnetting in assessment area LH05 (subarea of management area 4-4).

LAKE TROUT/BACKCROSS

- Allocation remained at 1,582 kgs.
- Harvest increased to 1,592 kgs, 103% of the allocation (Figure 44). Most of the harvest came from LH05 (Figure 45).

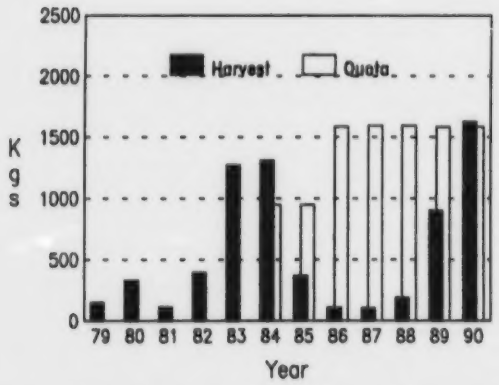

Figure 44. Lake trout/backcross harvest and quota (kgs) for management area 4-4 (LH05,LH06,LH07).

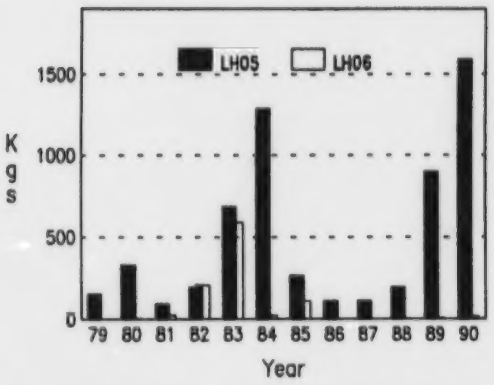

Figure 45. Lake trout/backcross harvest (kgs) for management area 4-4 (LH05, LH06, LH07).

MANAGEMENT AREA 4-5

GENERAL

- Harvest of all fish species under quota control increased 2% to 993,877 kgs (Table 27). Value of these fish decreased 5% to $3,406,806.
- Harvest and value of the non-quota species is given in Table 28.

Table 27. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 4-5 (LH08, LH09), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	32055	28305	46734	60.1
Chub	79250	31721	151161	21.0
Lake Trout	30451	11985	36908	32.5
Lake Whitefish	1878401	604795	625697	96.7
Northern Pike	17	5	227	2.2
Pink Salmon	0	0	3273	0.0
Sturgeon	24142	3349	3587	93.4
Walleye	551717	129420	138504	93.4
Yellow Perch	810774	184302	264894	69.6
Total	3406806	993877		

Table 28. Value ($) and round weight (kgs) by non-quota species for management area 4-5 (LH08, LH09), 1990.

Species	Value ($)	Harvest (kgs)
Alewife	13	185
American Eel	8	4
Bigmouth Buffalo	14	20
Burbot	909	1093
Carp	3607	6748
Freshwater Drum	13941	23404
Gizzard Shad	269	488
Lake Herring	11	4
Longnose Gar	4	3
Pacific Salmon	0	9
Rainbow Smelt	0	71
Redhorse	3389	5739
Rock Bass	20	26
Round Whitefish	548	400
Suckers	5202	10493
White Bass	6744	4266
White Perch	2526	2040
Total	37205	54993

LAKE WHITEFISH

- The allocation increased 8% to 625,697 kgs.
- The harvest increased 9% to 604,795 kgs, 97% of the allocation (Figure 46). The gill net fishery accounted for 97% of the harvest with the remainder coming out of the trap net fishery (Figure 47).
- Gill net effort decreased 11% (2055 kms) (Figure 48).
- CUE in the gill net fishery increased by 27% to 285 kgs/km (Figure 49).
- Age composition of the stock has improved substantially over the last ten years. The fishery now has a broad age base with ages 3 through 9 contributing significantly to the catch (Tables 29,30,31).
- Abundance increased more than predicted in 1990. The strong 1986 and 1987 year-classes had a greater impact than expected as they recruited to the fishery (Tables 32,33,34).
- Abundance will increase substantially in 1991 with the entry of the strong 1988 year-class as age 3 fish (Figure 50). Abundance will continue to increase in 1992.

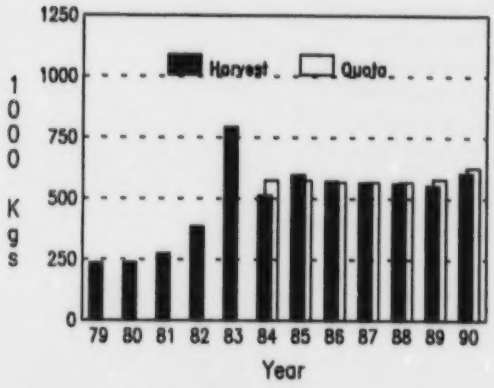

Figure 46. Lake whitefish harvest and quota in kilograms for management area 4-5 (LH08, LH09).

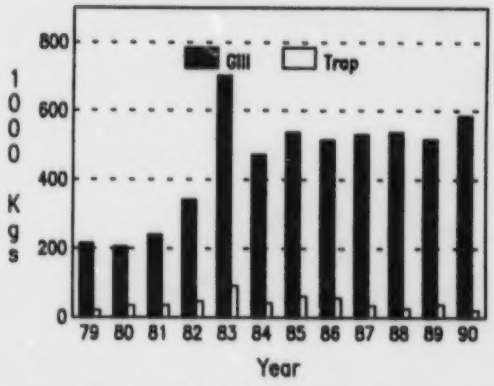

Figure 47. Lake whitefish harvest in kilograms for management area 4-5 (LH08, LH09)

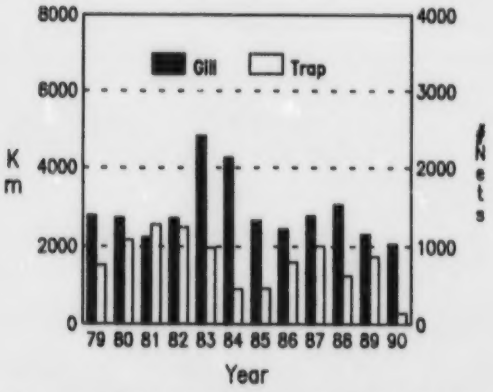

Figure 48. Lake whitefish annual gill net effort (km) for management area 4-5 (LH08, LH09).

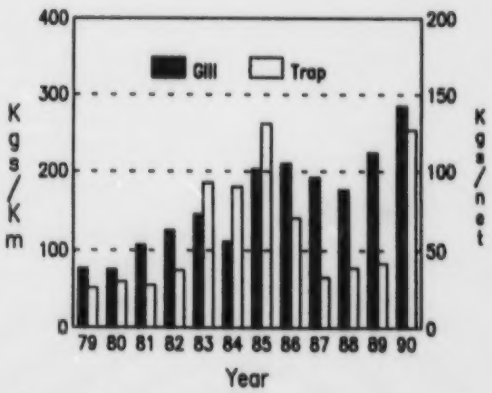

Figure 49. Lake whitefish annual CUEs (kgs/km) for management area 4-5 (LH08, LH09).

Table 29. Age-class composition of lake whitefish harvested in gill nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0	0	82	0
2	50703	86554	137184	170969	51304	116317	777	5191	14478	40854	6367	8162
3	54127	91993	101276	126422	603216	219316	348481	93624	52500	92502	144943	74977
4	57193	9282	10159	20707	30538	80083	54405	231418	65232	52884	54603	159086
5	12414	2830	1326	1758	5785	5150	32440	20405	185180	46242	32589	36083
6	1492	48	993	226	1751	1871	6861	6738	33156	90621	28191	16979
7	104	183	551	766	1446	346	1264	1169	16375	16090	62224	22812
8	0	0	0	226	305	483	2372	1314	4573	10970	13677	44608
9	104	0	0	0	0	0	81	321	3273	3528	7158	15065
10	104	805	0	0	0	0	0	161	86	1241	2579	9176
11	0	0	0	226	0	0	162	0	764	78	545	2231
12	0	0	0	0	0	0	81	0	43	308	0	1151
13	0	0	0	0	0	0	0	0	0	149	222	0
>13	0	0	0	0	0	0	0	0	0	0	222	133

Table 30. Age-class composition of harvested lake whitefish harvested in trap nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0	0	0	0
2	289	0	0	5116	331	471	0	0	0	0	0	0
3	4418	24322	32599	19085	84113	23765	61848	3603	3824	10107	19332	3940
4	7668	0	3622	4498	6069	11582	6486	36517	4894	2853	2180	5319
5	2065	0	0	3502	431	1638	585	1618	10367	1398	1090	591
6	0	3475	0	69	39	378	21	2513	1640	3319	975	158
7	0	0	0	646	0	252	0	222	885	504	3500	118
8	0	0	0	0	627	0	8	0	383	317	458	1182
9	0	0	0	215	0	0	0	0	0	112	1032	158
10	0	0	0	215	0	0	0	0	0	0	115	236
11	0	0	0	0	0	0	0	0	0	38	0	79
12	0	0	0	0	0	0	0	0	40	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	170	0	0	0	39

Table 31. Age-class composition of harvested and released lake whitefish caught in trap nets in management area 4-5 (LH08, LH09).

AGE	1986	1987	1988	1989	1990
1	0	0	0	0	0
2	2939	10007	17286	6278	4057
3	20131	12853	16566	36302	10466
4	38349	5028	2853	2180	5319
5	1618	10367	1398	1090	591
6	2513	1640	3319	975	158
7	222	885	504	3500	118
8	0	383	317	458	1182
9	0	0	112	1032	158
10	0	0	0	115	236
11	0	0	38	0	79
12	0	40	0	0	0
13	0	0	0	0	0
>13	170	0	0	0	39

Table 32. CUE-at-age for lake whitefish harvested in gill nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
2	18.13	31.73	61.15	62.90	10.67	27.30	0.29	2.12	5.22	13.35	2.76	3.97
3	19.35	33.73	45.15	46.51	125.45	51.48	131.24	38.15	18.92	30.22	62.73	36.48
4	20.45	3.40	4.53	7.62	6.35	18.80	20.49	94.29	23.51	17.28	23.63	77.40
5	4.44	1.04	0.59	0.65	1.20	1.21	12.22	8.31	66.75	15.11	14.10	17.56
6	0.53	0.02	0.44	0.08	0.36	0.44	2.58	2.75	11.95	29.61	12.20	8.26
7	0.04	0.07	0.25	0.28	0.30	0.08	0.48	0.48	5.90	5.26	26.93	11.10
8	0.00	0.00	0.00	0.08	0.06	0.11	0.89	0.54	1.65	3.58	5.92	21.70
9	0.04	0.00	0.00	0.00	0.00	0.00	0.03	0.13	1.18	1.15	3.10	7.33
10	0.04	0.30	0.00	0.00	0.00	0.00	0.00	0.07	0.03	0.41	1.12	4.46
11	0.00	0.00	0.00	0.08	0.00	0.00	0.06	0.00	0.28	0.03	0.24	1.09
12	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.10	0.00	0.56
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.10	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.06

Table 33. CUE-at-age for harvested lake whitefish harvested in trap nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.38	0.00	0.00	4.10	0.34	1.04	0.00	0.00	0.00	0.00	0.00	0.00
3	5.82	22.40	25.57	15.29	85.39	52.35	133.29	4.50	3.79	16.15	22.14	26.62
4	10.10	0.00	2.84	3.60	6.16	25.51	13.98	45.65	4.85	4.56	2.50	35.94
5	2.72	0.00	0.00	2.81	0.44	3.61	1.26	2.02	10.26	2.23	1.25	3.99
6	0.00	3.20	0.00	0.06	0.04	0.83	0.05	3.14	1.62	5.30	1.12	1.06
7	0.00	0.00	0.00	0.52	0.00	0.56	0.00	0.28	0.88	0.81	4.01	0.80
8	0.00	0.00	0.00	0.00	0.64	0.00	0.02	0.00	0.38	0.51	0.52	7.99
9	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.18	1.18	1.06
10	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.13	1.60
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.53
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.27

Table 34. CUE-at-age for harvested and released lake whitefish caught in trap nets in management area 4-5 (LH08, LH09).

AGE	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00
2	3.67	9.91	27.61	7.19	27.41
3	25.16	12.73	26.46	41.58	70.72
4	47.94	4.98	4.56	2.50	35.94
5	2.02	10.26	2.23	1.25	3.99
6	3.14	1.62	5.30	1.12	1.06
7	0.28	0.88	0.81	4.01	0.80
8	0.00	0.38	0.51	0.52	7.99
9	0.00	0.00	0.18	1.18	1.06
10	0.00	0.00	0.00	0.13	1.60
11	0.00	0.00	0.06	0.00	0.53
12	0.00	0.04	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00
>13	0.21	0.00	0.00	0.00	0.27

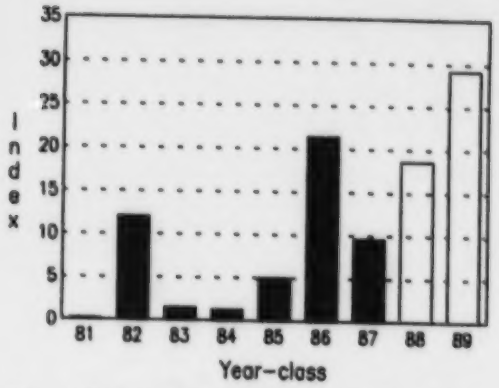

Figure 50. Indices of year-class strength for lake whitefish from index gillnetting in assessment areas LH08 and LH09 (subareas of management area 4-5).

CHUB

- Allocation decreased 11% to 151,161 kgs.
- Harvest increased 70% to 31,721 kgs, 21% of the allocation (Figure 51).
- Effort increased 12% to 189 kms (Figure 52).
- CUE of harvested fish increased 52% to 168 kgs/kms (Figure 53). Based on limited sampling it appears that an additional 93 kgs/km of small fish were discarded (Figure 54).
- The strong year-classes from 1982 to 1984 (ages 6,7,8) continue to support the fishery (Table 35). The slower growth of these large year-classes is such that recruitment to the fishery is still occurring at ages 7 to 8 (Table 36). The poor contribution of the 1985 through 1987 year-classes in commercial gear confirms the weakness predicted from index fishing (Figure 56).
- The increase in abundance was the result of continued recruitment of the 1983 and 1984 year-classes rather than the initial appearance of the succeeding year-classes.
- Abundance will remain high in 1991 on the strength of the contributions of the 1982 through 1984 year-classes. Timing of the impact of the weak 1985 through 1987 year-classes will depend on the amount of fishing in 1991.

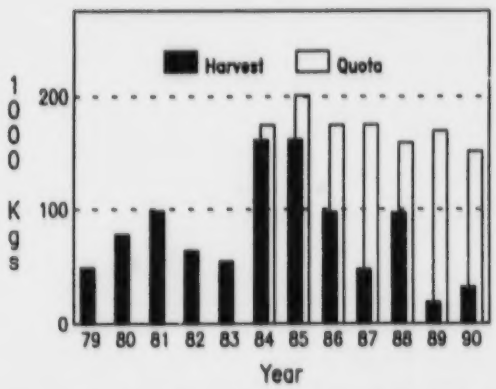

Figure 51. Chub harvest and quota in kilograms for management area 4-5 (LH08, LH09).

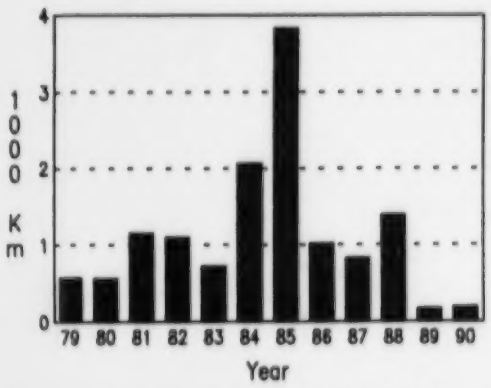

Figure 52. Chub annual gill net effort (km) for management area 4-5 (LH08, LH09).

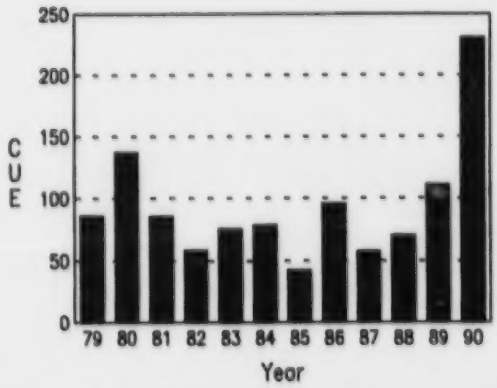

Figure 53. Chub annual gill net CUEs (kgs/km) for management area 4-5 (LH08, LH09).

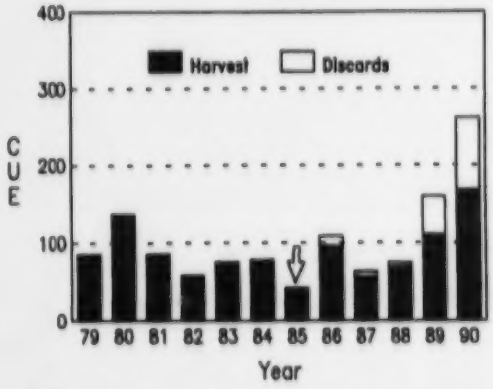

Figure 54. Chub annual gill net CUEs (kgs/km) (harvest + discards) for management area 4-5 (LH08,LH09).

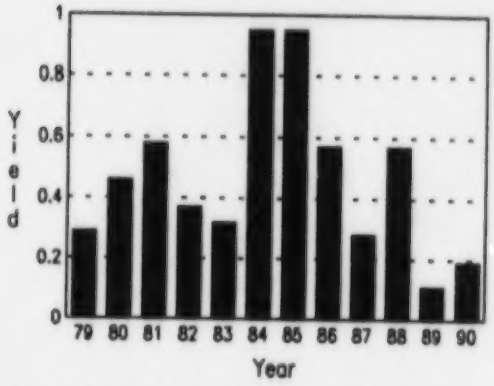

Figure 55. Chub yield (kgs/ha) for management area 4-5 (LH08, LH09).

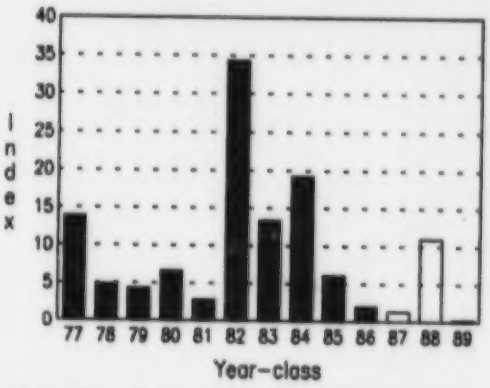

Figure 56. Indices of year-class strength for chub from USFWS trawling in assessment area LH08 (subarea of management area 4-5).

Table 35. Age-class composition of chub caught in gill nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0		0	0	0	0	0	0	0	0
2	3425	0	0		0	0	916	0	0	0	0	0
3	7016	176322	16467		5677	13963	25090	2737	8098	3553	269	2048
4	51232	26334	341093	N	26470	88454	36677	51159	19775	57228	2794	6143
5	31922	27830	38196	O	102811	183668	263663	201604	65948	148592	22974	9379
6	27654	19539	37565		117042	277309	219236	173018	83825	259602	61298	74638
7	33178	24730	7919	D	3284	265402	177410	59781	62529	114200	45424	119025
8	8177	29719	10440	A	1892	15305	77612	23650	32084	35610	11756	50199
9	2761	8047	6658	T	1892	0	610	2136	9476	6874	6172	19948
10	0	7224	630	A	0	0	0	276	694	1820	440	0
11	272	3976	0		0	0	0	0	938	1163	0	0
12	0	0	0		0	0	0	0	126	698	314	0
13	272	816	0		0	0	0	0	0	0	0	0
>13	0	0	0		0	0	0	0	0	0	0	0

Note: corrected for discards 1987 onward.

Table 36. CUE-at-age for chub caught in gill nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.99	0.00	0.00		0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00
3	12.27	310.32	14.32		7.87	6.77	6.55	2.70	9.75	2.56	1.59	10.86
4	89.58	46.35	296.60	N	36.70	42.89	9.57	50.39	23.80	41.30	16.54	32.57
5	55.82	48.98	33.21	O	142.56	89.06	68.79	198.57	79.37	107.25	136.02	49.73
6	48.35	34.39	32.67		162.29	134.46	57.20	170.41	100.88	187.37	362.92	395.75
7	58.01	43.52	6.89	D	4.55	128.69	46.28	58.88	75.25	82.43	268.94	631.10
8	14.30	52.30	9.08	A	2.62	7.42	20.25	23.29	38.61	25.70	69.60	206.17
9	4.83	14.16	5.79	T	2.62	0.00	0.16	2.10	11.40	4.96	36.54	105.77
10	0.00	12.71	0.55	A	0.00	0.00	0.00	0.27	0.84	1.31	2.61	0.00
11	0.48	7.00	0.00		0.00	0.00	0.00	0.00	1.13	0.84	0.00	0.00
12	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.15	0.50	1.86	0.00
13	0.48	1.44	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: corrected for discards 1987 onward.

YELLOW PERCH

- Allocation decreased 5% to 264,894 kgs.
- Harvest decreased 23% to 184,302 kgs, 70% of the allocation (Figure 57). Most of the harvest (98%) came from the gill net fishery (Figure 58).
- Gill net effort decreased 14% to 3026 kms (Figure 59).
- CUE decreased 10% to 60 kgs/km (Figure 60).
- The catch was dominated by age 3 and 4 fish as predicted (Tables 37,38).
- Abundance did not change significantly from 1989.
- Abundance will increase in 1991 with the addition of a third strong year-class (Figure 61). Abundance should remain high in 1992.

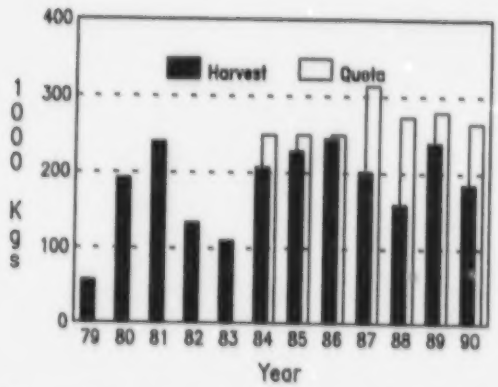

Figure 57. Yellow perch harvest and quota in kilograms for management area 4-5 (LH08, LH09).

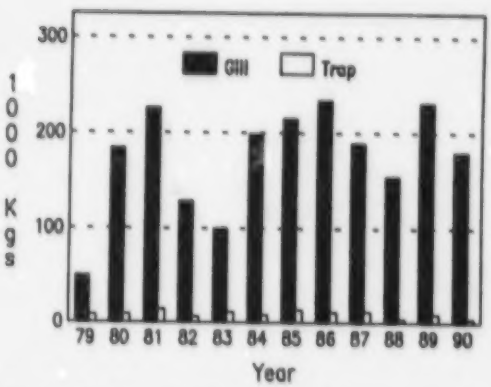

Figure 58. Yellow perch harvest in kilograms for management area 4-5 (LH08, LH09).

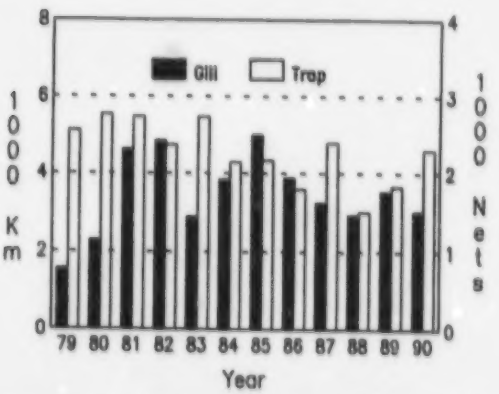

Figure 59. Yellow perch annual effort for management area 4-5 (LH08, LH09).

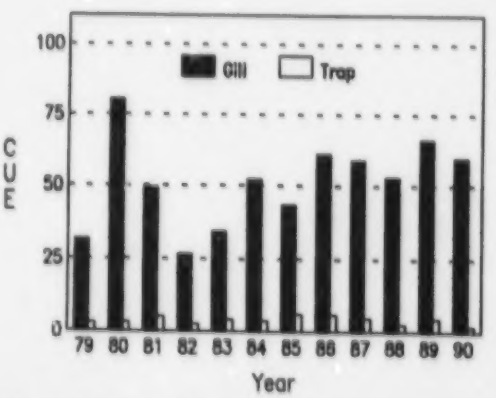

Figure 60. Yellow perch CUEs for management area 4-5 (LH08, LH09).

Table 37. Age-class composition of yellow perch caught in gill nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	1072	0	0	0	0	0	0
2	102254	0	26067	162200	197313	17173	0	0	7281	26778	97921	73518
3	129528	892471	295096	315317	323503	1111419	504878	482108	104651	485360	1499624	765091
4	77349	332561	1115011	110928	115643	222957	872250	900741	739238	443247	112601	574093
5	40874	31535	321517	218537	53838	22874	114652	479710	543132	265428	33860	14120
6	13551	9292	8860	16208	51655	10446	10518	23024	158854	57249	8531	7112
7	4406	3871	12103	7481	4194	2734	4266	989	15260	3602	6007	7176
8	1202	2323	0	1488	0	0	0	719	1308	1972	1550	7288
9	0	0	1424	2231	0	0	0	719	693	0	1362	2581
10	0	0	0	0	645	0	330	0	0	0	0	336
11	0	0	0	0	0	0	0	0	0	134	0	282
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0	0	0	0	0

Table 38. Age-class composition of yellow perch caught in trap nets in management area 4-5 (LH08, LH09).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0
2	977	10426	627	1104	0	745	81	1321	42
3	7264	31972	46913	38986	7015	2357	3352	25656	6274
4	5364	10281	8421	45527	42597	17241	8432	7790	5273
5	10670	6115	799	6164	14425	28070	4783	6264	813
6	1106	6115	640	338	2510	12490	4776	1922	228
7	507	1385	651	363	1328	3237	1268	3317	305
8	296	362	713	438	109	2911	238	1572	42
9	162	453	0	75	193	0	0	242	102
10	0	0	62	0	78	0	41	96	42
11	0	0	62	151	0	447	0	0	0
12	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0
>13	0	0	0	0	0	0	0	0	0

Table 39. CUE-at-age (number/km) for yellow perch caught in gill nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
2	65.67	0.00	5.67	33.56	68.49	4.48	0.00	0.00	2.25	9.14	27.90	24.30
3	83.19	389.81	64.18	65.24	112.29	290.04	101.45	125.20	32.30	165.60	427.35	252.84
4	49.68	145.25	242.49	22.95	40.14	58.18	175.26	233.91	228.17	151.23	32.09	189.72
5	26.25	13.77	69.92	45.22	18.69	5.97	23.04	124.57	167.64	90.56	9.65	4.67
6	8.70	4.06	1.93	3.35	17.93	2.73	2.11	5.98	49.03	19.53	2.43	2.35
7	2.83	1.69	2.63	1.55	1.46	0.71	0.86	0.26	4.71	1.23	1.71	2.37
8	0.77	1.01	0.00	0.31	0.00	0.00	0.00	0.19	0.40	0.67	0.44	2.41
9	0.00	0.00	0.31	0.46	0.00	0.00	0.00	0.19	0.21	0.00	0.39	0.85
10	0.00	0.00	0.00	0.00	0.22	0.00	0.07	0.00	0.00	0.00	0.00	0.11
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.09
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 40. CUE-at-age (number/nets) for yellow perch caught in trap nets in management area 4-5 (LH08, LH09).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.17	0.97	0.08	0.08	0.00	0.07	0.02	0.16	0.02
3	1.29	2.96	6.20	2.94	0.67	0.21	0.88	3.15	2.74
4	0.95	0.95	1.11	3.43	4.05	1.55	2.21	0.96	2.30
5	1.89	0.57	0.11	0.46	1.37	2.52	1.25	0.77	0.35
6	0.20	0.57	0.08	0.03	0.24	1.12	1.25	0.24	0.10
7	0.09	0.13	0.09	0.03	0.13	0.29	0.33	0.41	0.13
8	0.05	0.03	0.09	0.03	0.01	0.26	0.06	0.19	0.02
9	0.03	0.04	0.00	0.01	0.02	0.00	0.00	0.03	0.04
10	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.02
11	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

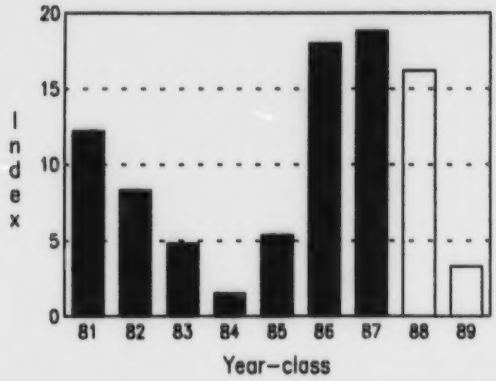

Figure 61. Indices of year-class strength for yellow perch from index gillnetting in assessment areas LH08 and LH09 (subareas of management area 4-5).

WALLEYE

- Allocation remained virtually unchanged at 138,504 kgs.
- Harvest increased 17% to 129,415 kgs, 93% of the allocation (Figure 62). Most of the harvest (93%) came from the trap net fishery (Figure 63).
- Trap net effort remained virtually unchanged at 2017 lifts (Appendix Table 15, page 152).
- Trap net CUE increased 18% to 60 kgs/lift (Figure 64), however, this may be a result of how effort is reported on the new daily catch reports.
- As predicted, age 4,5,6 fish were well represented in the catch and age 3 fish were down substantially (Table 41).
- It is unlikely that abundance changed to the degree indicated by the CUE.
- Abundance will decline in 1991 as the last strong year-class (1986) moves to age 5. The 1988 year-class is likely stronger than indicated by the year-class strength index (Figure 65), nevertheless it is still lower than average and will not prevent a further decline in abundance in 1992.

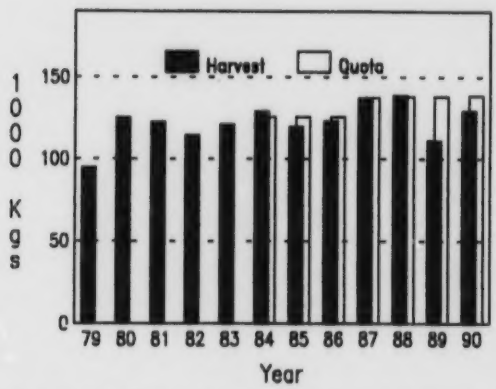

Figure 62. Walleye harvest and quota in kilograms for management area 4-5 (LH08, LH09).

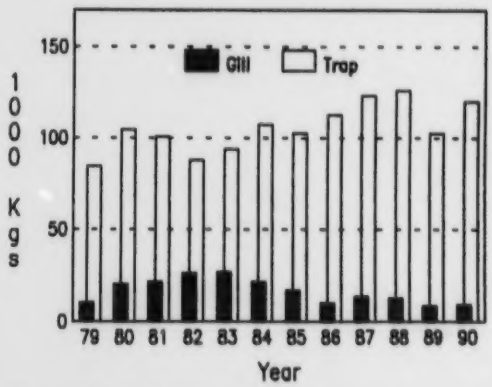

Figure 63. Walleye harvest in kilograms for management area 4-5 (LH08, LH09).

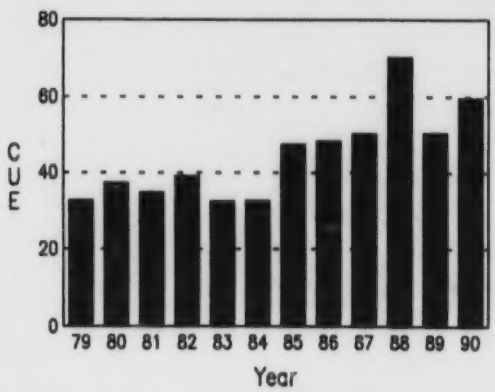

Figure 64. Walleye annual trap net CUEs (kgs/net) for management area 4-5 (LH08, LH09).

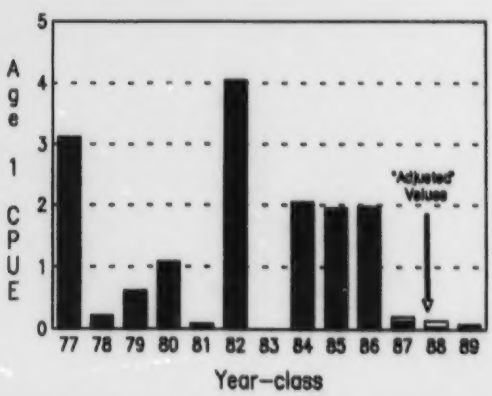

Figure 65. Indices of year-class strength for walleye from index fishing at Tremblay Creek, Lake St. Clair, for reference to Lake Huron assessment area LH09 (subarea of management area 4-5).

Table 41. Age-class composition of walleye harvested in trap nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	115	381	1456	0	1506	858	215	286	293	1500	1785	276
2	67689	7410	25804	18308	15247	97187	2412	22911	42270	29008	5082	11846
3	5143	109515	9704	29297	80757	17375	117167	10378	76358	53907	54242	15713
4	10228	4632	62617	8334	15041	37095	6448	65787	8790	42338	20321	46477
5	7263	3859	3808	29132	4123	9017	7806	8113	22012	6727	15578	12818
6	2607	3264	2193	1417	8579	3911	1986	7021	2575	14480	2700	12141
7	2508	921	2372	619	602	8679	2150	3415	2856	1556	7185	2130
8	3241	1767	341	2161	911	820	3117	2364	801	2548	2237	8757
9	1524	1773	1355	1080	408	287	323	1209	1159	693	1479	2484
10	231	1533	553	1382	378	191	238	502	621	668	362	1308
11	346	434	1199	410	18	342	144	171	158	160	623	581
12	231	125	262	326	244	96	238	0	0	0	519	305
13	0	325	80	0	86	0	0	0	0	0	0	0
>13	0	47	0	0	0	0	0	0	0	0	0	0

Table 42. CUE-at-age for walleye harvested in trap nets in management area 4-5 (LH08, LH09).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.04	0.14	0.50	0.00	0.52	0.26	0.10	0.13	0.12	0.84	0.88	0.14
2	26.21	2.65	8.90	8.13	5.25	29.45	1.12	10.27	17.23	16.17	2.50	5.87
3	1.99	39.14	3.35	13.00	27.80	5.27	54.17	4.65	31.13	30.05	26.69	7.79
4	3.96	1.66	21.61	3.70	5.18	11.24	2.98	29.50	3.58	23.60	10.00	23.04
5	2.81	1.38	1.31	12.93	1.42	2.73	3.61	3.64	8.97	3.75	7.67	6.36
6	1.01	1.17	0.76	0.63	2.95	1.19	0.92	3.15	1.05	8.07	1.33	6.02
7	0.97	0.33	0.82	0.27	0.21	2.63	0.99	1.53	1.16	0.87	3.54	1.06
8	1.25	0.63	0.12	0.96	0.31	0.25	1.44	1.06	0.33	1.42	1.10	4.34
9	0.59	0.63	0.47	0.48	0.14	0.09	0.15	0.54	0.47	0.39	0.73	1.23
10	0.09	0.55	0.19	0.61	0.13	0.06	0.11	0.23	0.25	0.37	0.18	0.65
11	0.13	0.16	0.41	0.18	0.01	0.10	0.07	0.08	0.06	0.09	0.31	0.29
12	0.09	0.04	0.09	0.14	0.08	0.03	0.11	0.00	0.00	0.00	0.26	0.15
13	0.00	0.12	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LAKE TROUT/BACKCROSS

- Allocation increased 8% to 36,908 kgs.
- Harvest decreased 21% to 11,985 kgs, 32% of the allocation (Figure 66). Most of the harvest came from gill nets (Figure 67).

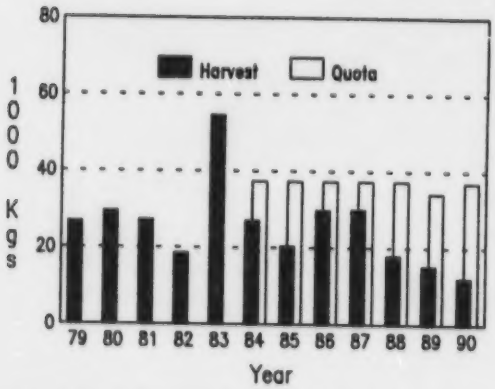

Figure 66. Lake trout/backcross harvest and quota (kgs) for management area 4-5 (LH08, LH09).

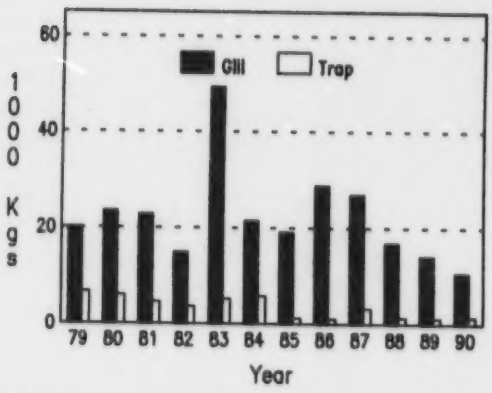

Figure 67. Lake trout/backcross harvest in kilograms for management area 4-5 (LH08, LH09).

MANAGEMENT AREA 4-7

GENERAL

- Harvest of all fish species under quota control decreased 13% to 95,885 kgs (Table 43). Value of these fish decreased 4% to $211,101.
- Harvest and value of the non-quota species is given in Table 44.

Table 43. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 4-7 (LH04), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	1	1	unlimited	n/a
Chub	40967	23691	55463	42.7
Lake Trout	974	284	744	38.2
Lake Whitefish	169103	71889	73518	97.8
Northern Pike	0	0	225	0.0
Pink Salmon	0	0	819	0.0
Sturgeon	0	0	0	
Walleye	41	15	450	3.3
Yellow Perch	15	5	1577	0.3
Total	211101	95885		

Table 44. Value ($) and round weight (kgs) by non-quota species for management area 4-7 (LH04), 1990.

Species	Value ($)	Harvest (kgs)
Lake Herring	1	2
Round Whitefish	6	14
White Bass	5	4
Total	12	20

LAKE WHITEFISH

- The allocation rose 8% to 73,518 kgs.
- The harvest rose 20% to 71,889 kgs, 98% of the allocation (Figure 68).
- Gill net effort stayed at 312 kms (Figure 69).
- CUE increased 20% to 230 kgs/km (Figure 70).
- Sample sizes preclude comment on age-class composition (Tables 45,46).
- Abundance increased as predicted in 1990.
- Abundance will increase substantially in 1991 with the entry of the strong 1987 year-class as age 4 fish (Figure 31, page 29). Abundance will remain high in 1992.

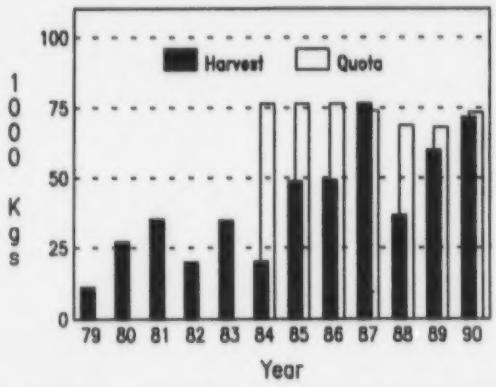

Figure 68. Lake whitefish harvest and quota in kilograms for management area 4-7 (LH04).

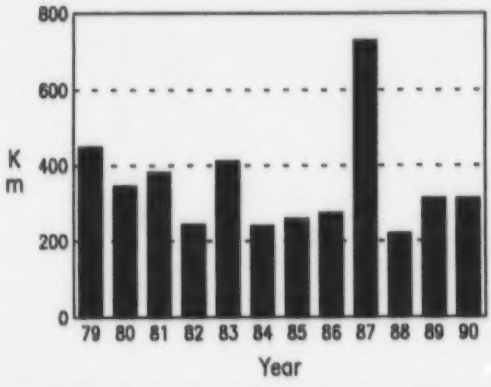

Figure 69. Lake whitefish annual gill net effort (km) for management area 4-7 (LH04).

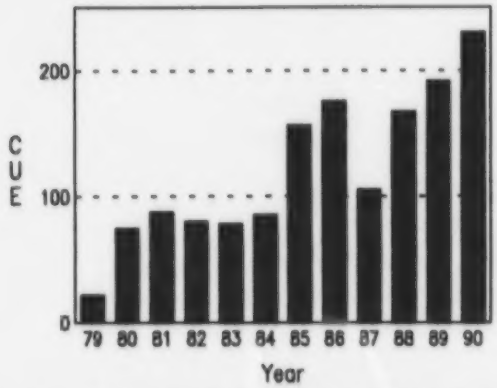

Figure 70. Lake whitefish gill net CUEs (kgs/km) for management area 4-7 (LH04).

Table 45. Age-class composition of lake whitefish harvested in gill nets in management area 4-7 (LH04).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	21411	788	1982	7295	1068	4378	1739	3275	5535	2564	0
4	155	21914	2510	12709	9964	14961	32281	25361	6989	27519	20213
5	1221	555	6278	1394	1327	11840	3602	18369	7461	7161	20213
6	531	183	101	3535	132	1436	2227	4254	1818	1767	3032
7	0	376	306	0	525	165	260	1423	718	1727	7075
8	0	79	92	159	0	275	0	566	498	245	0
9	0	157	148	159	0	0	53	420	139	245	0
10	0	23	92	0	0	0	0	20	61	122	0
11	78	183	0	0	0	0	0	20	0	122	0
12	0	0	0	0	0	0	0	44	0	122	0
13	78	0	0	0	0	0	0	0	0	0	0
>13	0	23	34	0	0	0	0	0	0	0	0

Table 46. CUE-at-age (number/km) for lake whitefish harvested in gill nets in management area 4-7 (LH04).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	47.81	2.28	5.19	29.96	2.60	18.19	6.71	11.95	7.60	11.71	0.00
4	0.35	63.34	6.58	52.19	24.27	62.16	124.59	92.56	9.60	125.66	64.79
5	2.73	1.60	16.45	5.72	3.23	49.19	13.90	67.04	10.25	32.70	64.79
6	1.19	0.53	0.26	14.52	0.32	5.97	8.60	15.53	2.50	8.07	9.72
7	0.00	1.09	0.80	0.00	1.28	0.69	1.00	5.19	0.99	7.89	22.68
8	0.00	0.23	0.24	0.65	0.00	1.14	0.00	2.07	0.68	1.12	0.00
9	0.00	0.45	0.39	0.65	0.00	0.00	0.20	1.53	0.19	1.12	0.00
10	0.00	0.07	0.24	0.00	0.00	0.00	0.00	0.07	0.08	0.56	0.00
11	0.17	0.53	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.56	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.56	0.00
13	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00	0.07	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CHUB

- Allocation increased 3% to 55,463 kgs.
- Harvest decreased 52% to 23,691 kgs, 43% of the allocation (Figure 71).
- Effort decreased 47% to 270 kms (Figure 72).
- CUE decreased 9% to 88 kgs/kms (Figure 73).
- Yield decreased to 0.17 kgs/ha (Figure 75).
- No age structure data available.
- Abundance changed little from 1989 as predicted.
- Abundance should remain relatively constant in 1991 but begin to decline in 1992 as the upcoming weak year-classes replace the strong year-classes currently supporting the fishery.

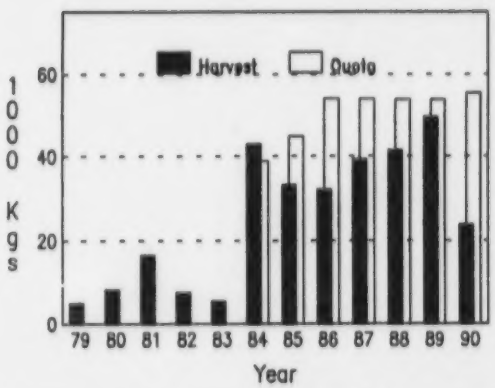

Figure 71. Chub harvest and quota in kilograms for management area 4-7 (LH04).

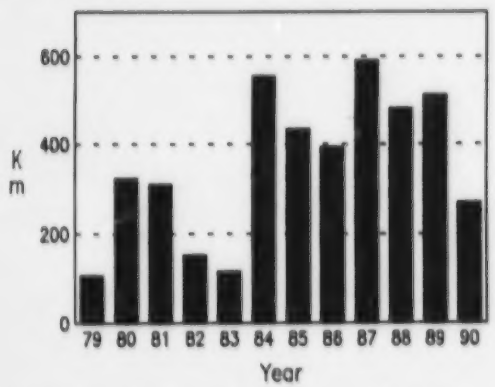

Figure 72. Chub annual gill net effort (km) for management area 4-7 (LH04).

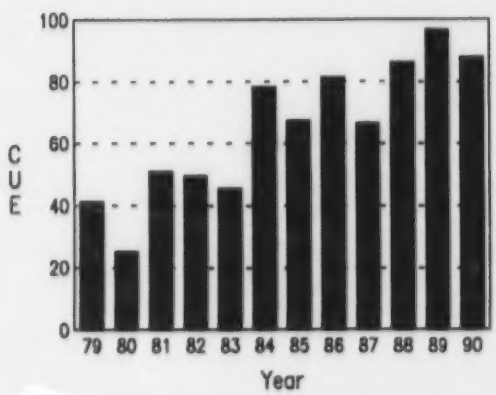

Figure 73. Chub annual gill net CUEs (kgs/km) for management area 4-7 (LH04).

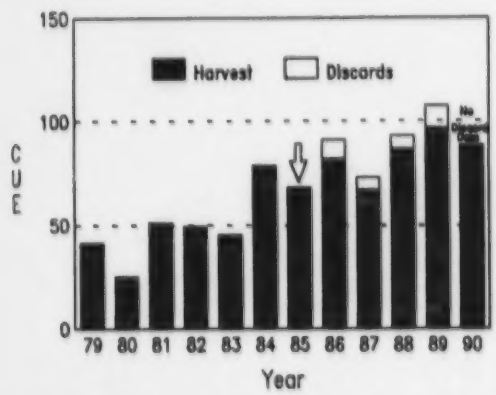

Figure 74. Chub annual gill net CUEs (kgs/km) (harvest + discards) for management area 4-7 (LH04).

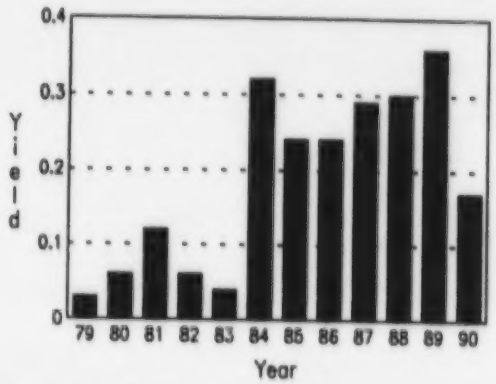

Figure 75. Chub yield (kgs/ha) for management area 4-7 (LH04).

Table 47. Age-class composition of chub caught in gill nets in management area 4-7 (LH04).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0			0	0	0	0	0	0	
2	747	677			0	0	0	0	0	0	
3	18923	4477			4366	5448	165	658	0	0	
4	8508	74427	N	N	19395	21872	8749	15574	8568	4521	N
5	5195	4528	O	O	41172	34150	35670	65130	58514	67272	O
6	2995	364			82873	54067	64587	50107	98383	97011	
7	5240	1040	D	D	54050	43083	38237	62597	50403	67748	D
8	2199	364	A	A	1141	10649	16517	25722	23990	9575	A
9	0	0	T	T	2119	0	3401	15372	10784	0	T
10	0	0	A	A	0	0	0	2870	1433	0	A
11	0	0			0	0	422	301	0	0	
12	0	0			0	0	0	603	0	0	
13	0	0			0	0	0	187	0	0	
>13	0	0			0	0	0	0	0	0	

Note: corrected for discards 1987 onward.

Table 48. CUE-at-age (number/km) for chub caught in gill nets in management area 4-7 (LH04).

AGE	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00	
2	2.31	2.18			0.00	0.00	0.00	0.00	0.00	0.00	
3	58.60	14.41			7.85	12.51	0.42	1.11	0.00	0.00	
4	26.35	239.62	N	N	34.87	50.23	22.20	26.35	17.82	8.82	N
5	16.09	14.58	O	O	74.02	78.43	90.51	110.20	121.68	131.26	O
6	9.28	1.17			149.00	124.18	163.88	84.78	204.58	189.29	
7	16.23	3.35	D	D	97.18	98.95	97.02	105.92	104.81	132.19	D
8	6.81	1.17	A	A	2.05	24.46	41.91	43.52	49.89	18.68	A
9	0.00	0.00	T	T	3.81	0.00	8.63	26.01	22.42	0.00	T
10	0.00	0.00	A	A	0.00	0.00	0.00	4.86	2.98	0.00	A
11	0.00	0.00			0.00	0.00	1.07	0.51	0.00	0.00	
12	0.00	0.00			0.00	0.00	0.00	1.02	0.00	0.00	
13	0.00	0.00			0.00	0.00	0.00	0.32	0.00	0.00	
>13	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00	

Note: corrected for discards 1987 onward.

MANAGEMENT AREA 5-1

GENERAL

- Harvest of all fish species under quota control decreased 29% to 11,214 kgs (Table 49). Value of these fish decreased 29% to $23,640.
- Harvest and value of the non-quota species is given in Table 50.

Table 49. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-1 (GB01), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	7	8	0	*
Chub	1323	752	17052	4.4
Lake Trout	2262	1180	2482	47.5
Lake Whitefish	14122	7461	33722	22.1
Northern Pike	404	205	1632	12.6
Pink Salmon	0	0	637	0.0
Sturgeon	0	0	637	0.0
Walleye	1135	303	1971	15.4
Yellow Perch	4387	1305	24983	5 2
Total	23640	11214		

* division by zero

Table 50. Value ($) and round weight (kgs) by non-quota species for management area 5-1 (GB01), 1990.

Species	Value ($)	Harvest (kgs)
Carp	89	177
Lake Herring	747	660
Round Whitefish	5361	7557
Suckers	0	4
Total	6197	8398

LAKE WHITEFISH

- The allocation dropped 5% to 33,722 kgs.
- The harvest rose 1% to 7,461 kgs, 22% of the allocation (Figure 76).
- Gill net effort decreased 14% to 105 kms (Figure 77).
- CUE increased 17% to 71 kgs/km (Figure 78).
- No appreciable change in this stock.
- Although not directly applicable to this stock pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 153, page 105).
- No prediction concerning future abundance in 1991 or 1992.

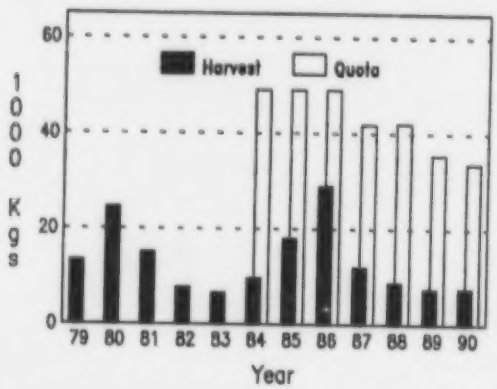

Figure 76. Lake whitefish harvest and quota in kilograms for management area 5-1 (GB01).

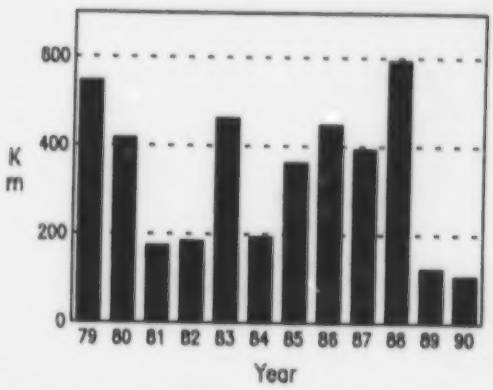

Figure 77. Lake whitefish annual gill net effort (km) for management area 5-1 (GB01).

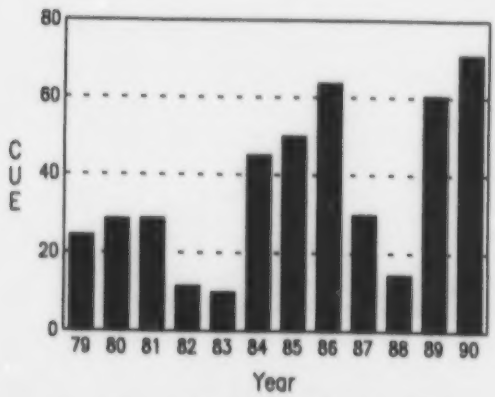

Figure 78. Lake whitefish gill net CUEs (kgs/km) for management area 5-1 (GB01).

CHUB

- The allocation remained at 17,052 kgs.
- The harvest decreased 80% to 752 kgs, 4% of the allocation (Figure 79).
- Effort decreased 51% to 7 km (Figure 80).
- CUE decreased 60% to 103 kgs/km (Figure 81).
- Yield decreased to 0.43 kgs/ha (Figure 82).
- CUE is an unreliable indicator of abundance due to minimal fishing effort.
- No prediction concerning future abundance for 1991 or 1992.

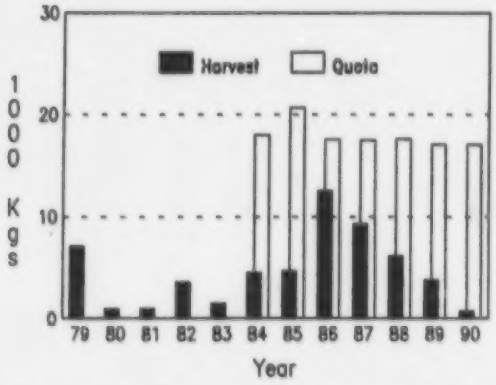

Figure 79. Chub harvest and quota in kilograms for management area 5-1 (GB01).

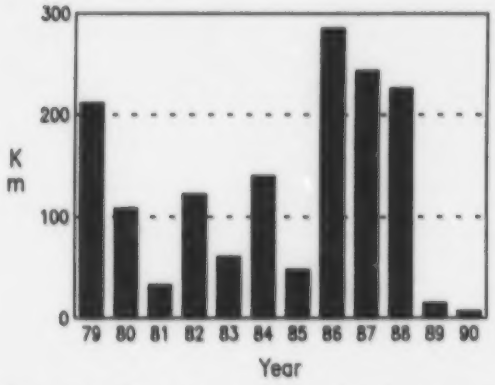

Figure 80. Chub annual gill net effort (km) for management area 5-1 (GB01).

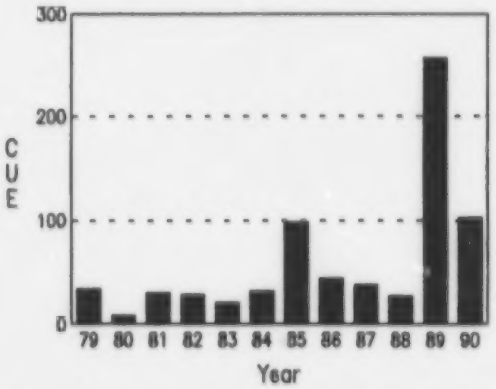

Figure 81. Chub annual gill net CUEs (kgs/km) for management area 5-1 (GB01).

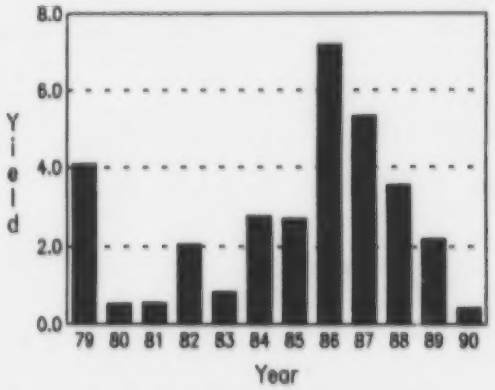

Figure 82. Chub yield (kgs/ha) for management area 5-1 (GB01).

YELLOW PERCH

- The allocation decreased slightly to 24,983 kgs.
- The harvest decreased 32% to 1,305 kgs, 5% of the allocation (Figure 83).
- Effort decreased 5% to 36 km (Figure 84).
- CUE increased 97% to 36 kgs/km (Figure 85).
- Unlikely that CUE is a reliable indicator of abundance due to minimal fishing effort.
- No prediction concerning future abundance for 1991 or 1992.

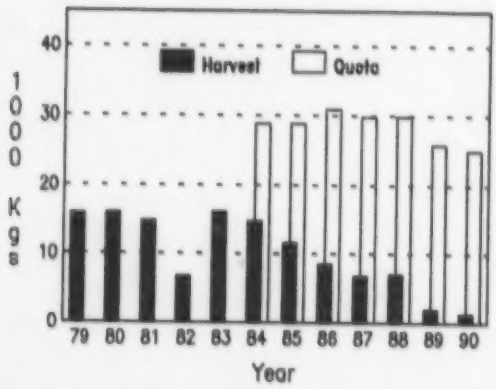

Figure 83. Yellow perch harvest and quota in kilograms for management area 5-1 (GB01).

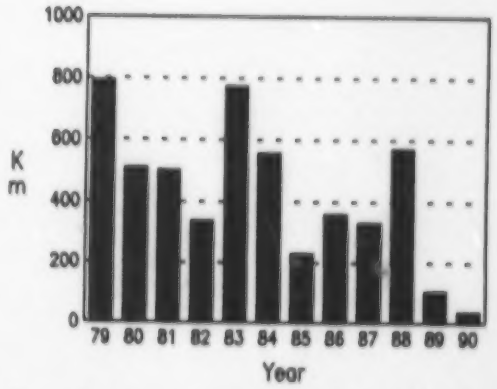

Figure 84. Yellow perch annual gill net effort (km) for management area 5-1 (GB01).

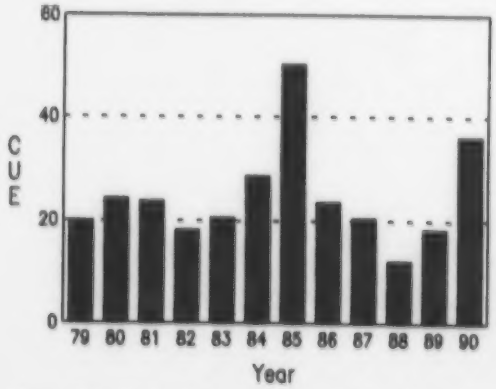

Figure 85. Yellow perch annual gill net CUEs for management area 5-1 (GB01).

LAKE TROUT/BACKCROSS

- Allocation decreased 4% to 2,482 kgs.
- Harvest increased 40% to 1,180 kgs, 48% of the allocation (Figure 86).
- No prediction concerning future abundance for 1991 or 1992.

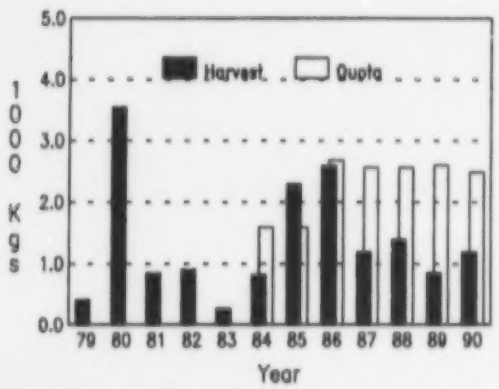

Figure 86. Lake trout/backcross harvest and quota in kilograms for management area 5-1 (GB01).

MANAGEMENT AREA 5-2

GENERAL

- Harvest of all fish species under quota control decreased 2% to 3,916 kgs (Table 51). Value of these fish decreased 9% to $13,514.
- Harvest and value of the non-quota species is given in Table 52.

Table 51. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-2 (GB02) 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	0	0	0	
Chub	138	92	20001	0.5
Lake Trout	0	0	0	
Lake Whitefish	6682	2553	18901	13.5
Northern Pike	273	128	455	28.1
Pink Salmon	0	0	630	0.0
Sturgeon	0	0	46	0.0
Walleye	6374	1133	4568	24.8
Yellow Perch	47	10	1244	0.8
Total	13514	3916		

Table 52. Value ($)and round weight (kgs) by non-quota species for management area 5-2 (GB02) 1990.

Species	Value ($)	Harvest (kgs)
Burbot	1026	2922
Carp	578	1805
Caviar	0	35
Lake Herring	3060	1988
Round Whitefish	125	76
Suckers	4595	9680
Discarded (mixed)	0	436
Total	9384	16942

LAKE WHITEFISH

- The allocation dropped 2% to 18,901 kgs.
- The harvest increased by 52% to 2,553 kgs, 14% of the allocation (Figure 87).
- Gill net effort decreased 7% to 31 kms (Figure 88).
- CUE increased 60% to 82 kgs/km (Figure 89). Low fishing effort precludes using CUE as a reliable indicator of abundance.
- Although not directly applicable to this stock, pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 153, page 105).
- No prediction concerning future abundance in 1991 or 1992.

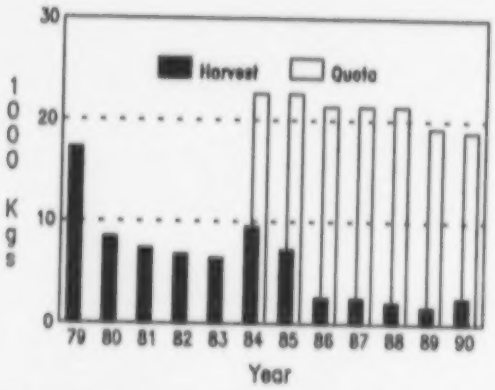

Figure 87. Lake whitefish harvest and quota in kilograms for management area 5-2 (GB02).

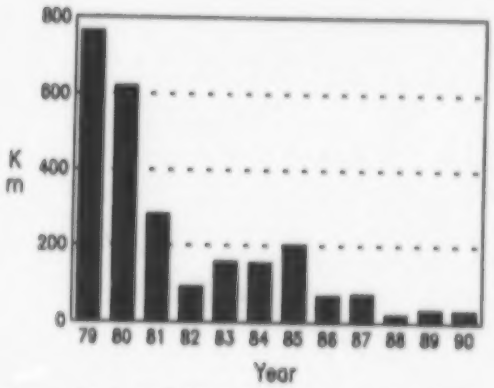

Figure 88. Lake whitefish annual gill net effort (km) for management area 5-2 (GB02).

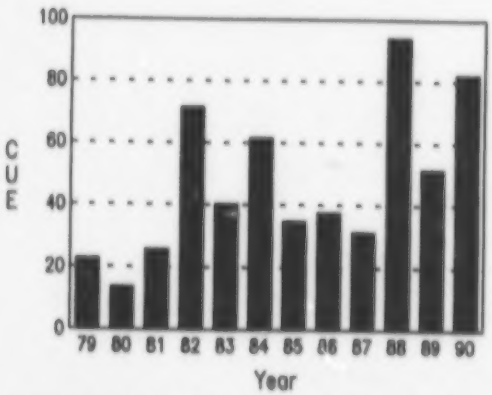

Figure 89. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-2 (GB02).

CHUB

- The allocation remained virtually unchanged at 20,001 kgs.
- The harvest decreased 16% to 92 kgs, less than 1% of the allocation (Figure 90).
- Effort was 2 km (Figure 91).
- CUE was 63 kgs/km (Figure 92).
- Yield was 0.01 kgs/ha (Figure 93).
- CUE is an unreliable indicator of abundance due to minimal fishing effort.
- No prediction concerning future abundance for 1991 or 1992.

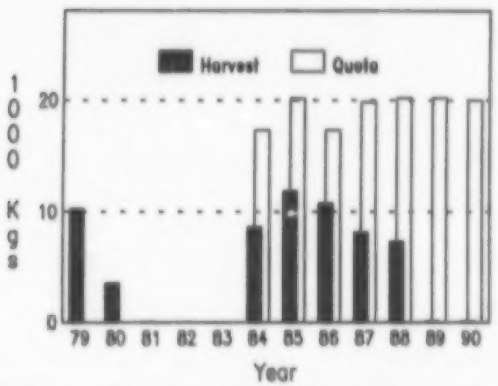

Figure 90. Chub harvest and quota in kilograms for management area 5-2 (GB02).

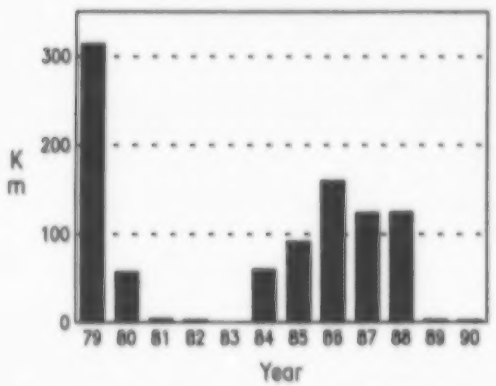

Figure 91. Chub annual gill net effort (km) for management area 5-2 (GB02).

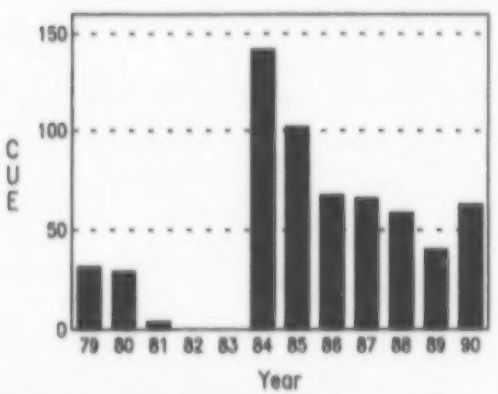

Figure 92. Chub annual gill net CUEs (kgs/km) for management area 5-2 (GB02).

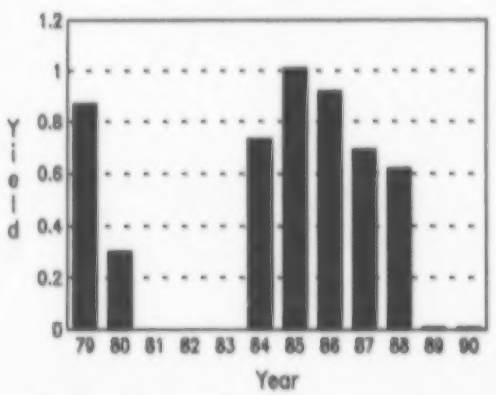

Figure 93. Chub yield (kgs/ha) for management area 5-2 (GB02).

YELLOW PERCH

- Allocation remained at 1,244 kgs.
- Harvest was 10 kgs, 1% of the allocation (Figure 94).
- Effort was 0.5km (Figure 95).
- CUE was 18 kgs/km (Figure 96).
- No prediction concerning future abundance for 1991 or 1992.

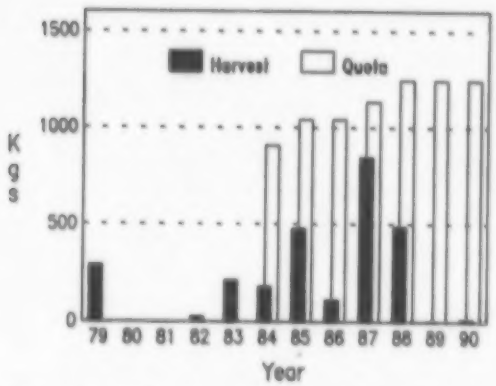

Figure 94. Yellow perch harvest and quota in kilograms for management area 5-2 (GB02).

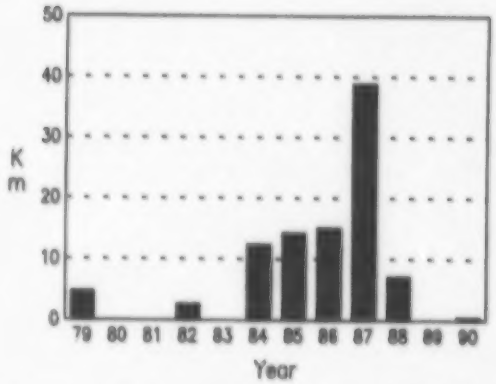

Figure 95. Yellow perch annual gill net effort (km) for management area 5-2 (GB02).

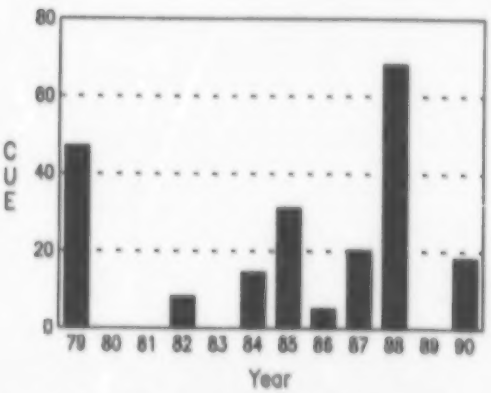

Figure 96. Yellow perch annual gill net CUEs (kgs/km) for management area 5-2 (GB02).

WALLEYE

- The allocation was virtually unchanged at 4,568 kgs.
- The harvest decreased 42% to 1,133 kgs, 25% of the allocation (Figure 97).
- CUE increased 119% to 47 kgs/km (Figure 98)
- CUE is an unreliable indicator of abundance due to minimal fishing effort.
- No prediction concerning future abundance for 1991 or 1992.

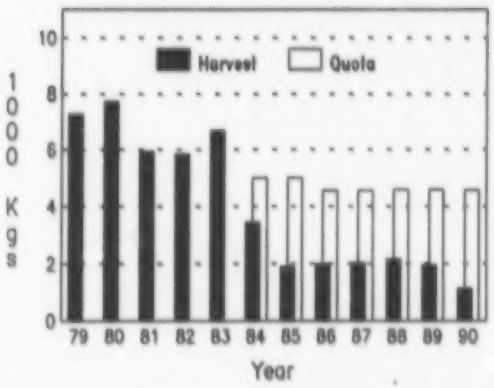

Figure 97. Walleye harvest and quota in kilograms for management area 5-2 (GB02).

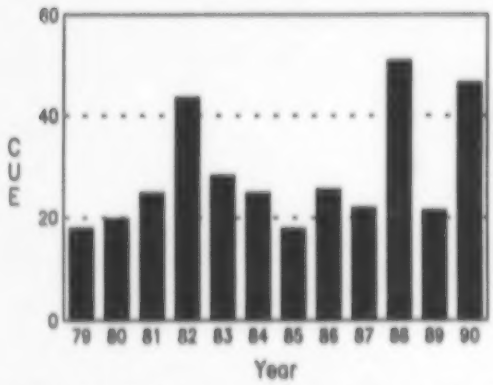

Figure 98. Walleye annual gill net CUEs (kgs/km) for management area 5-2 (GB02).

MANAGEMENT AREA 5-3

GENERAL

- Harvest of all fish species under quota control decreased 14% to 137,186 kgs (Table 53). Value of these fish decreased 10% to $258,377.
- Harvest and value of the non-quota species is given in Table 54.

Table 53. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-3 (GB03, GB04, GB06), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	67	99	908	10.9
Chub	225921	123302	198722	62.0
Lake Trout	1555	429	2706	15.9
Lake Whitefish	29940	13153	35440	37.1
Northern Pike	0	0	414	0.0
Pink Salmon	0	0	998	0.0
Sturgeon	0	0	0	
Walleye	401	91	0	*
Yellow Perch	493	112	4423	2.5
Total	258377	137186		

* division by zero

Table 54. Value ($) and round weight (kgs) by non-quota species for management area 5-3 (GB03, GB04, GB06), 1990.

Species	Value ($)	Harvest (kgs)
Burbot	0	1224
Suckers	0	91
Discarded (mixed)	0	724
Total	0	2039

LAKE WHITEFISH

- The allocation dropped 3% to 33,440 kgs.
- The harvest increased by 46% to 13,153 kgs, 37% of the allocation (Figure 99). Most of the harvest came from area GB03 (83%).
- Gill net effort increased 50% to 87 kms (Figure 100).
- CUE in GB03 decreased 12% to 157 kgs/km (Figure 101).
- Although not directly applicable to this stock, pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 153, page 105).
- No prediction concerning future abundance in 1991 or 1992.

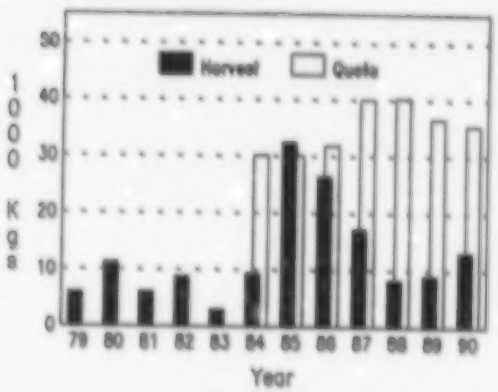

Figure 99. Lake whitefish harvest and quota in kilograms for management area 5-3 (GB03, GB04, GB06).

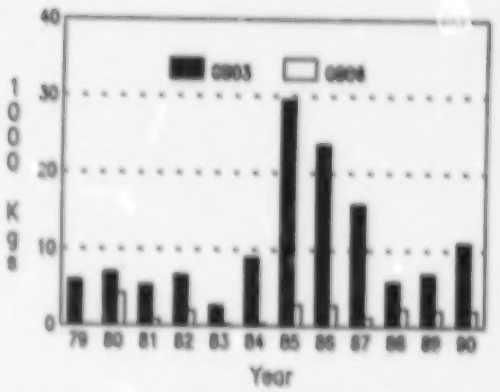

Figure 100. Lake whitefish harvest (kgs) by area for management area 5-3 (GB03, GB04, GB06).

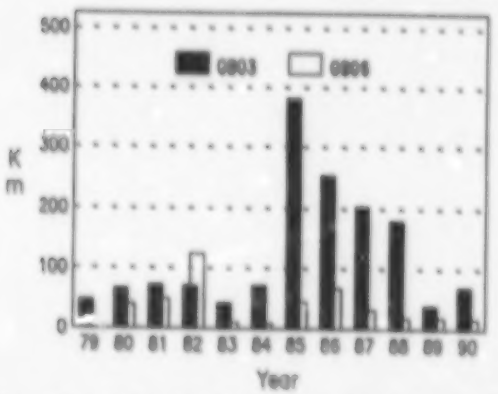

Figure 101. Lake whitefish gill net effort (km) by area for management area 5-3 (GB03,GB04,GB06).

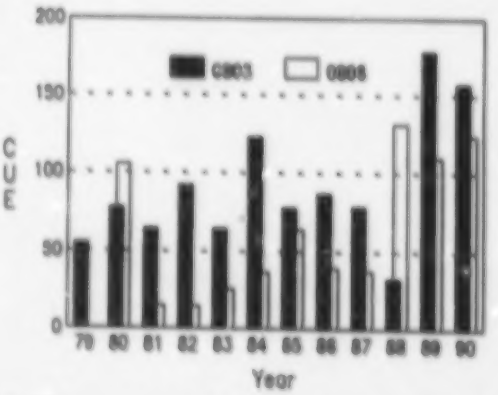

Figure 102. Lake whitefish annual gill net CUEs by area for management area 5-3 (GB03,GB04,GB06).

CHUB

- Allocation increased 7% to 198,722 kgs.
- Harvest decreased 18% to 123,302 kgs, 62% of the allocation (Figure 103). Most of the harvest came from areas GB03 (46%) and GB06 (49%) (Figure 104).
- Effort decreased 12% to 1554 km (Figure 105).
- The management area CUE of harvested fish decreased 25%, primarily the result of a decrease in CUE in assessment area GB03 (Figure 106). However, in this assessment area an additional 54 kgs/ha of fish were discarded indicating that overall CUE actually increased (Figure 107).
- Yield dropped across all three assessment areas (Figure 108).
- Age 6 and 7 fish dominated the catch (81%) as predicted (Table 55). The number of 5 year-old fish dropped as predicted but not as much as expected (Table 56).
- Abundance will remain high in 1991 mainly on the strength of the continued recruitment of the 1984 year-class. In 1992, abundance is expected to decline as the impact of weaker year-classes is felt.

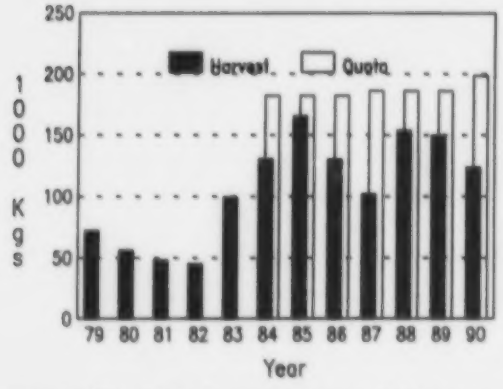

Figure 103. Chub harvest and quota in kilograms for management area 5-3 (GB03, GB04, GB06).

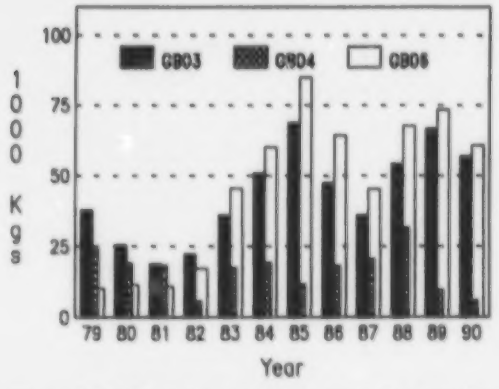

Figure 104. Chub harvest in kilograms by area for management area 5-3 (GB03, GB04, GB06).

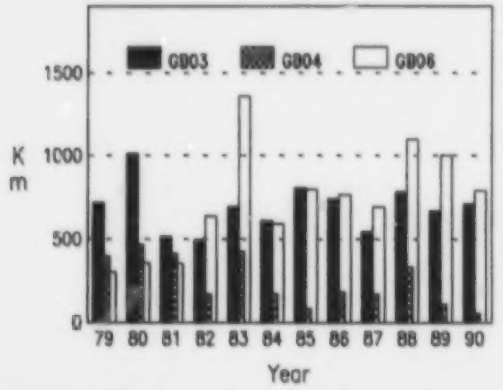

Figure 105. Chub annual gill net effort (km) by area for management area 5-3 (GB03, GB04, GB06).

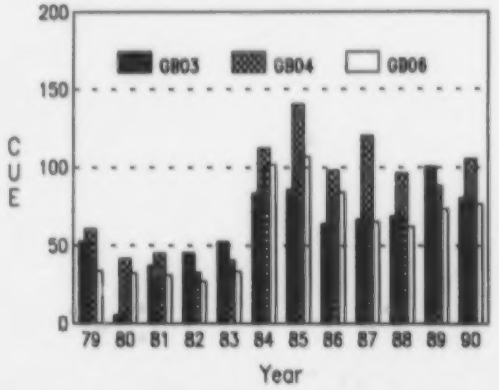

Figure 106. Chub annual gill net CUEs (kgs/km) by area for management area 5-3 (GB03,GB04,GB06).

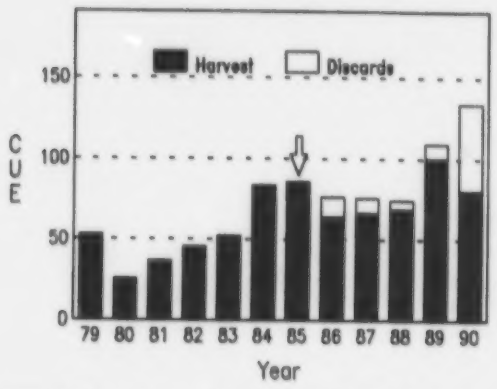

Figure 107. Chub annual gill net CUEs (kgs/km) (harvest + discards) for GB03 (sub-area of management area 5-3).

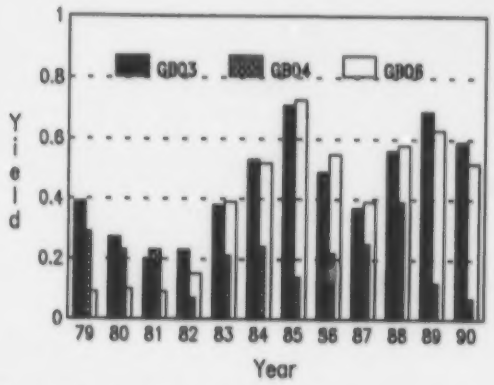

Figure 108. Chub yield (kgs/ha) for management area 5-3 (GB03, GB04, GB06).

Table 55. Age-class composition of chub caught in gill nets in assessment area GB03 (subarea of management area 5-3).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0		0	0	0	0	0	0	0
2	1158	0	3226	0		0	0	0	1048	0	0	0
3	15370	8484	38353	6554		4982	392	3758	2549	890	0	1329
4	22493	57010	36784	59413	N	67691	28634	4443	22282	23626	2751	5204
5	30215	19725	47299	28949	O	83916	96600	84131	40537	126273	74651	49416
6	51925	17282	3075	22809		49807	122345	90723	98439	70060	196624	199377
7	21577	14686	4465	4670	D	18029	51514	21242	37317	61781	44621	189677
8	13718	2802	2606	1369	A	5292	14704	13641	5411	16473	14005	24887
9	6775	2469	755	228	T	1708	3468	917	1291	2951	2657	8502
10	4505	925	755	0	A	1146	221	1124	0	219	0	452
11	3339	0	1716	0		0	221	917	0	99	628	0
12	2418	617	0	492		0	0	0	514	0	0	452
13	1511	309	0	0		0	0	0	0	0	0	0
>13	306	309	0	0		0	0	0	0	0	0	0

Note: corrected for discards 1987 onward.

Table 56. CUE-at-age (number/km) for chub caught in gill nets in assessment area GB03 (subarea of management area 5-3).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1.61	0.00	6.29	0.00		0.00	0.00	0.00	1.93	0.00	0.00	0.00
3	21.42	8.41	74.75	13.32		8.19	0.49	5.07	4.70	1.14	0.00	1.88
4	31.35	56.52	71.69	120.71	N	111.32	35.69	6.00	41.11	30.15	4.13	7.36
5	42.12	19.56	92.18	58.82	O	138.00	120.39	113.58	74.79	161.12	112.12	69.85
6	72.38	17.13	5.99	46.34		81.91	152.47	122.48	181.62	89.40	295.32	281.80
7	30.08	14.56	8.70	9.49	D	29.65	64.20	28.68	68.85	78.83	67.02	268.09
8	19.12	2.78	5.08	2.78	A	8.70	18.33	18.42	9.98	21.02	21.03	35.18
9	9.44	2.45	1.47	0.46	T	2.81	4.32	1.24	2.38	3.77	3.99	12.02
10	6.28	0.92	1.47	0.00	A	1.88	0.28	1.52	0.00	0.28	0.00	0.64
11	4.65	0.00	3.34	0.00		0.00	0.28	1.24	0.00	0.13	0.94	0.00
12	3.37	0.61	0.00	1.00		0.00	0.00	0.00	0.95	0.00	0.00	0.64
13	2.11	0.31	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.43	0.31	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00

YELLOW PERCH

- Allocation decreased to 4,423 kgs.
- Harvest was 112 kgs, 3% of the allocation (Figure 109).
- No prediction concerning future abundance for 1991 or 1992.

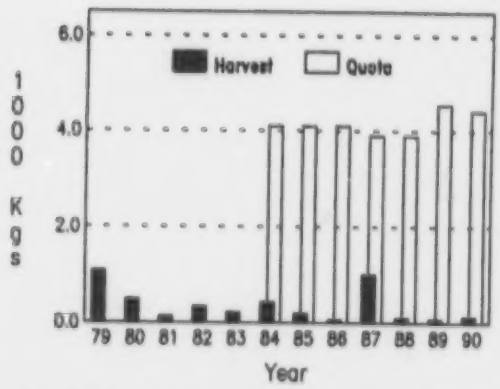

Figure 109. Yellow perch harvest and quota in kilograms for management area 5-3 (GB03, GB04, GB06).

LAKE TROUT/BACKCROSS

- The allocation was virtually unchanged at 2,706 kgs.
- The harvest decreased 30% to 429 kgs, 16% of the allocation (Figure 110). Harvest by assessment area is given in Figure 111.
- The overall management area CUE decreased 57% (Figure 111).
- No prediction concerning future abundance for 1991 or 1992.

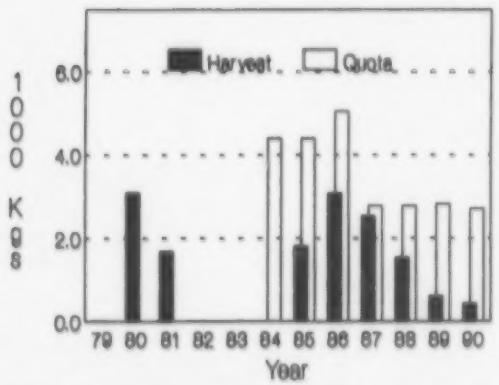

Figure 110. Lake trout/backcross harvest and quota (kgs) for management area 5-3 (GB03, GB04, GB06).

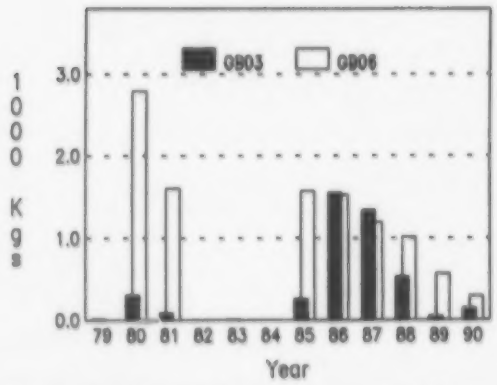

Figure 111. Lake trout/backcross harvest in kilograms for management area 5-3 (GB03, GB04, GB06).

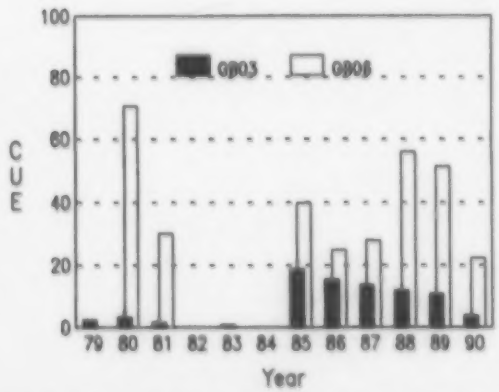

Figure 112. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 5-3 (GB03,GB04,GB06).

MANAGEMENT AREA 5-4

GENERAL

- Harvest of all fish species under quota control decreased 22% to 3,516 kgs (Table 57). Value of these fish increased 31% to $10,965.
- Harvest and value of the non-quota species is given in Table 58.

Table 57. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-4 (GB05), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	0	0	0	
Chub	328	169	25200	10.7
Lake Trout	0	0	0	
Lake Whitefish	5140	2019	6823	29.6
Northern Pike	0	0	0	
Pink Salmon	17	6	360	1.7
Sturgeon	0	0	0	
Walleye	182	45	159	28.3
Yellow Perch	5298	1277	5706	22.4
Total	10965	3516		

Table 58. Value ($) and round weight (kgs) by non-quota species for management area 5-4 (GB05), 1990.

Species	Value ($)	Harvest (kgs)
Burbot	6	13
Carp	6	29
Lake Herring	345	169
Round Whitefish	318	147
Suckers	123	139
Total	798	497

LAKE WHITEFISH

- The allocation dropped 5% to 6,823 kgs.
- The harvest dropped 33% to 2,019 kgs, 30% of the allocation (Figure 113).
- Gill net effort decreased 42% to 21 kms (Figure 114).
- CUE increased 17% to 96 kgs/km (Figure 115).
- Low fishing effort precludes using CUE as a reliable indicator of abundance. No appreciable change in this stock.
- Although not directly applicable to this stock, pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 153, page 105).
- No prediction concerning future abundance in 1991 or 1992.

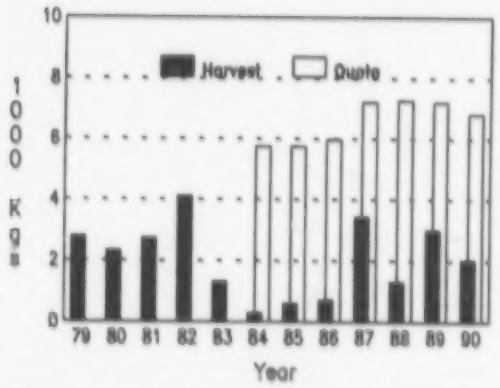

Figure 113. Lake whitefish harvest and quota in kilograms for management area 5-4 (GB05).

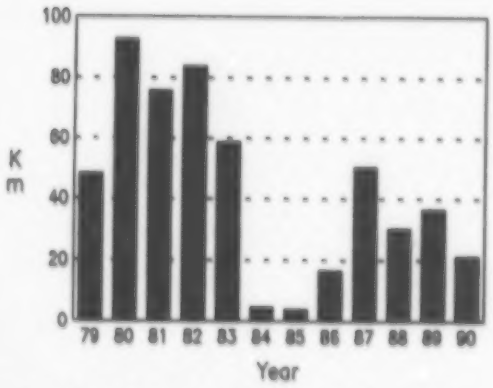

Figure 114. Lake whitefish annual gill net effort (km) for management area 5-4 (GB05).

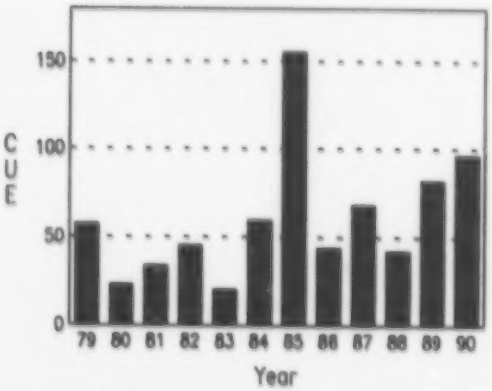

Figure 115. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-4 (GB05).

CHUB

- Allocation increased 40% to 25,200 kgs.
- Harvest was 169 kgs, less than 1% of the allocation (Figure 116).
- Effort was 4 km (Figure 117).
- CUE was 47 kgs/km (Figure 118).
- Yield was 0.01 kgs/ha (Figure 119).
- CUE is an unreliable indicator of abundance due to minimal fishing effort.
- No prediction concerning future abundance for 1991 or 1992.

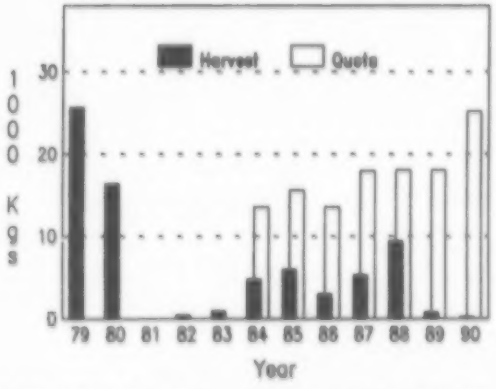

Figure 116. Chub harvest and quota in kilograms for management area 5-4 (GB05).

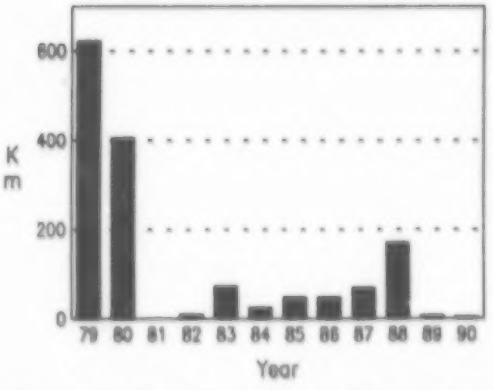

Figure 117. Chub annual gill net effort (km) for management area 5-4 (GB05).

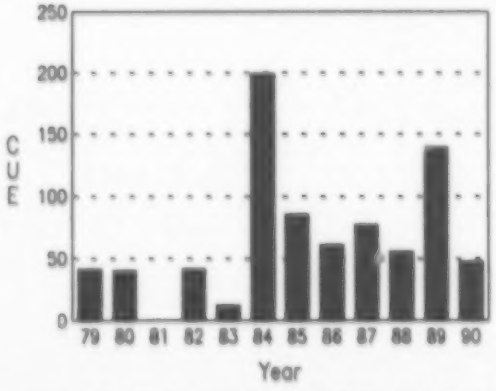

Figure 118. Chub annual gill net CUEs (kgs/km) for management area 5-4 (GB05).

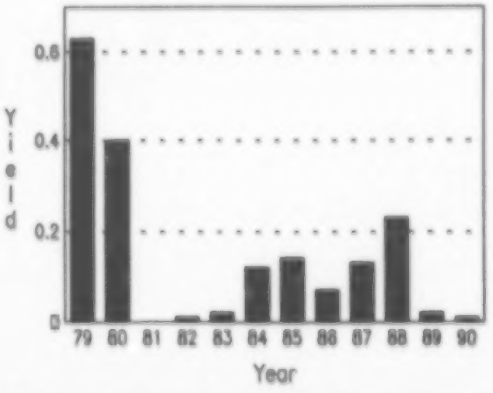

Figure 119. Chub yield (kgs/ha) for management area 5-4 (GB05).

YELLOW PERCH

- Allocation remained at 5,706 kgs.
- Harvest increased 87% to 1,277 kgs, 22% of the allocation (Figure 120).
- Effort increased 19% to 18 km (Figure 121).
- CUE increased 57% to 72 kgs/km (Figure 122).
- No prediction concerning future abundance for 1991 or 1992.

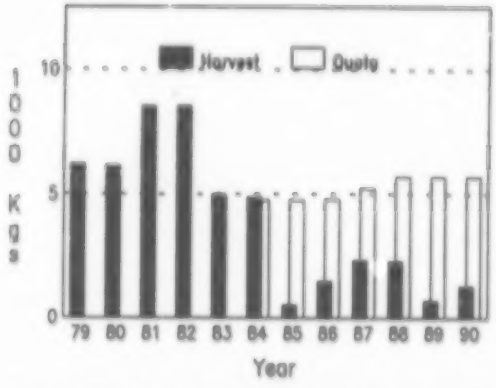

Figure 120. Yellow perch harvest and quota in kilograms for management area 5-4 (GB05).

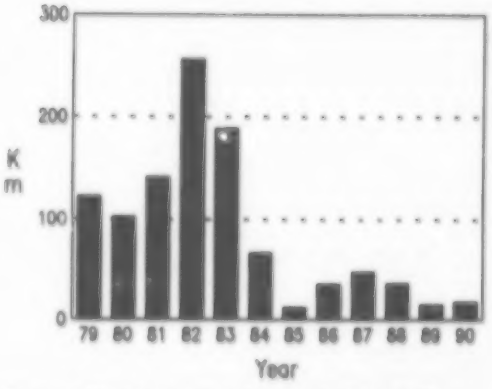

Figure 121. Yellow perch annual gill net effort (km) for management area 5-4 (GB05).

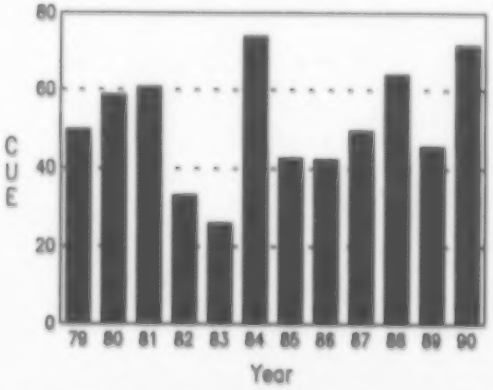

Figure 122. Yellow perch annual gill net CUEs for management area 5-4 (GB05).

MANAGEMENT AREA 5-5

GENERAL

- Harvest of all fish species under quota control decreased 53% to 15,161 kgs (Table 59). Value of these fish decreased 38% to $40,805.
- Harvest and value of the non-quota species is given in Table 60.

Table 59. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-5 (GB07), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	0	0	0	
Chub	11485	5980	34364	17.4
Lake Trout	0	0	0	
Lake Whitefish	10915	5103	11353	44.9
Northern Pike	0	0	0	
Pink Salmon	0	0	272	0.0
Sturgeon	0	0	0	
Walleye	0	0	0	
Yellow Perch	18405	4078	13128	31.1
Total	40805	15161		

Table 60. Value ($) and round weight (kgs) by non-quota species for management area 5-5 (GB07), 1990.

Species	Value ($)	Harvest (kgs)
Lake Herring	16	42
Round Whitefish	300	318
Total	316	360

LAKE WHITEFISH

- The allocation dropped 4% to 11,353 kgs.
- The harvest increased by 31% to 5,103 kgs, 45% of the allocation (Figure 123).
- Gill net effort increased 6% to 54 kms (Figure 124).
- Although CUE increased dramatically by 157% to 94 kgs/km (Figure 125), it is simply returning to mid 1980 levels.
- Abundance likely increased, but not necessarily by the degree indicated by CUE.
- Pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 153, page 105). On the assumption that these indices are applicable to some degree in area 5-5, we would expect abundance to increase in 1991.

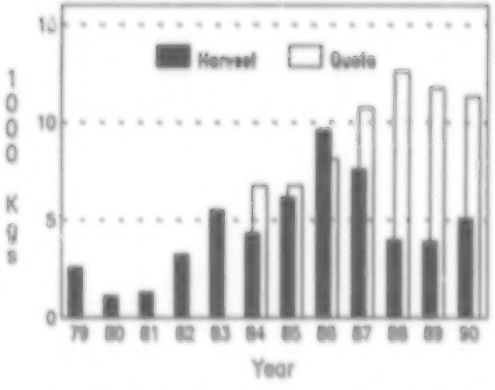

Figure 123. Lake whitefish harvest and quota in kilograms for management area 5-5 (GB07).

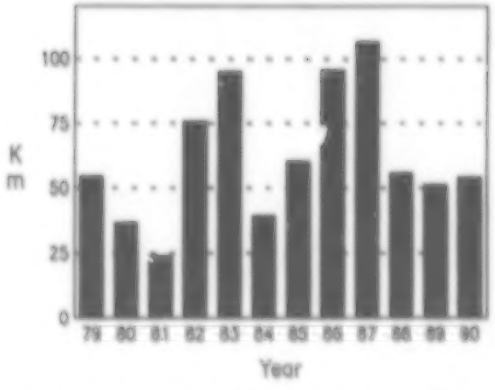

Figure 124. Lake whitefish annual gill net effort (km) for management area 5-5 (GB07).

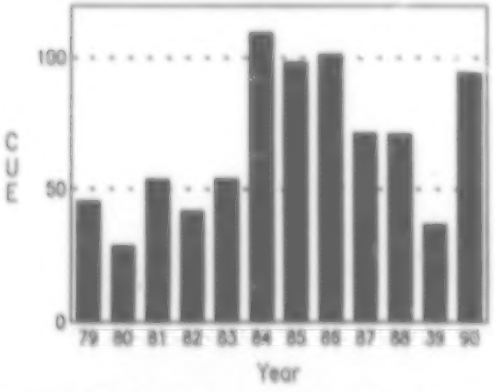

Figure 125. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-5 (GB07).

YELLOW PERCH

- Allocation was virtually unchanged at 13,128 kgs.
- Harvest decreased 16% to 4,078 kgs, 31% of the allocation (Figure 130).
- Effort decreased 38% to 56 km (Figure 131).
- CUE increased 35% to 73 kgs/km (Figure 132).
- No prediction concerning future abundance for 1991 or 1992.

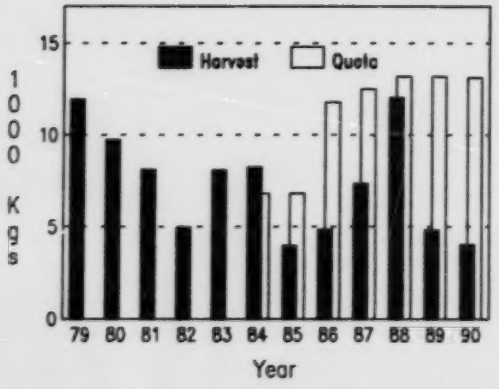

Figure 130. Yellow perch harvest and quota in kilograms for management area 5-5 (GB07).

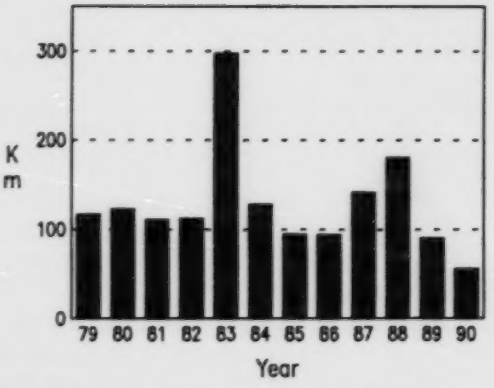

Figure 131. Yellow perch annual gill net effort (km) for management area 5-5 (GB07).

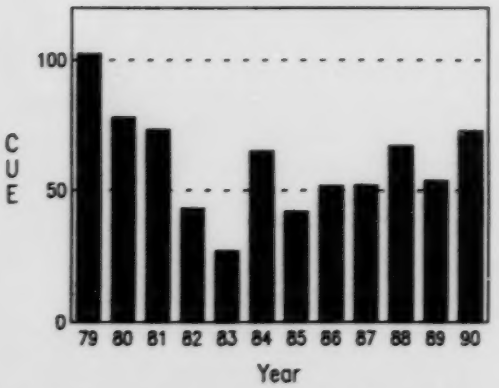

Figure 132. Yellow perch annual gill net CUEs (kgs/km) for management area 5-5 (GB07).

MANAGEMENT AREA 5-6

GENERAL

- Harvest of all fish species under quota control increased 2% to 49,260 kgs (Table 61). Value of these fish decreased 3% to $94,099.
- Harvest and value of the non-quota species is given in Table 62.

Table 61. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-6 (GB08), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	0	0	0	
Chub	75971	43668	60820	71.8
Lake Trout	12311	3373	4558	74.0
Lake Whitefish	4834	1981	16308	12.1
Northern Pike	15	7	0	*
Pink Salmon	0	0	545	0.0
Sturgeon	0	0	0	
Walleye	0	0	45	0.0
Yellow Perch	968	231	2541	9.1
Total	94099	49260		

* division by zero

Table 62. Value ($) and round weight (kgs) by non-quota species for management area 5-6 (GB08), 1990.

Species	Value ($)	Harvest (kgs)
Lake Herring	0	67
Round Whitefish	0	9
Discarded (mixed)	301	2268
Total	301	2344

LAKE WHITEFISH

- The allocation was virtually unchanged at 16,308 kgs.
- The harvest decreased by 70% to 1,981 kgs, 12% of the allocation (Figure 153).
- Effort and CUE data is of questionable value and therefore not included.
- Pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 153, page 105).
- No prediction concerning future abundance in 1991 and 1992.

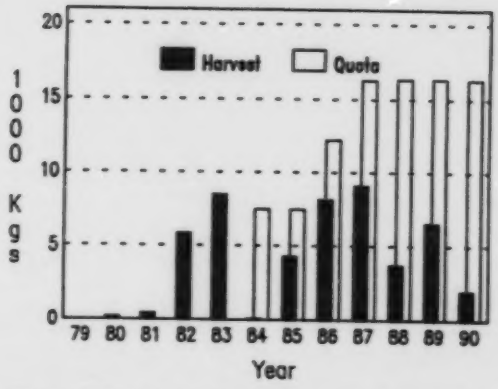

Figure 133. Lake whitefish harvest and quota in kilograms for management area 5-6 (GB08).

CHUB

- Allocation increased 10% to 60,820 kgs.
- Harvest increased 6% to 43,668 kgs, 72% of the allocation (Figure 134).
- Effort decreased 6% to 352 km (Figure 135).
- CUE of harvested fish increased 13% to 124 kgs/km (Figure 136). Virtually no change in the CUE (7 kgs/ha) of discarded fish (Figure 137).
- Yield was 0.30 kgs/ha (Figure 138).
- Age 6 and 7 fish dominated the catch (81%) as predicted (Table 56). The number of 5 year-old fish dropped as predicted but not as much as expected (Table 64).
- Abundance will remain high in 1991 mainly on the strength of the continued recruitment of the 1984 year-class. In 1992, abundance is expected to decline as the impact of weaker year-classes is felt.

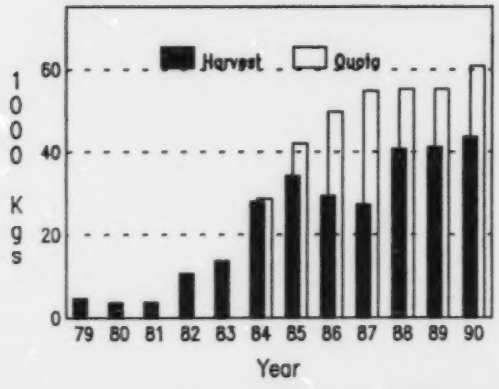

Figure 134. Chub harvest and quota in kilograms for management area 5-6 (GB08).

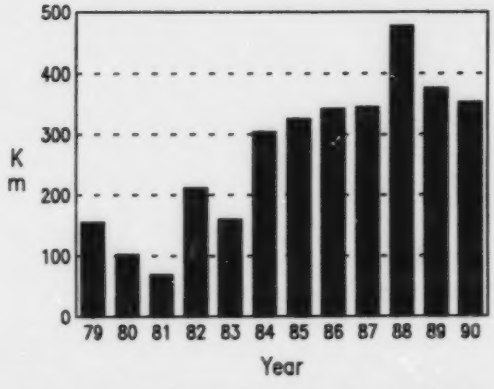

Figure 135. Chub annual gill net effort (km) for management area 5-6 (GB08).

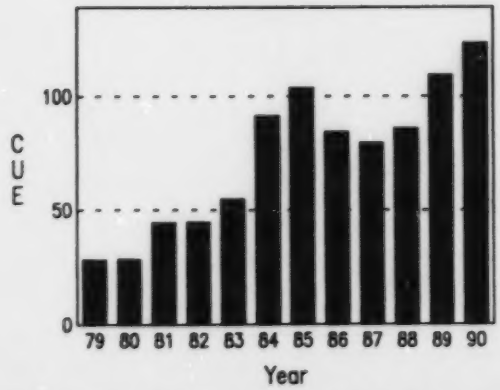

Figure 136. Chub annual gill net CUEs (kgs/km) for management area 5-6 (GB08).

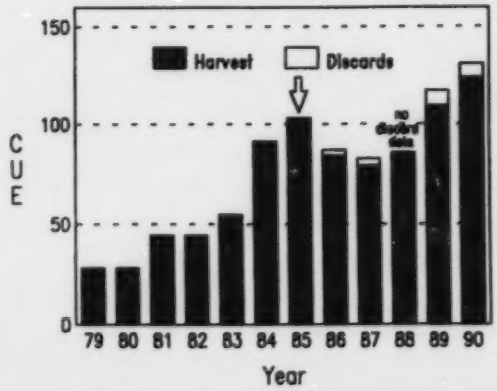

Figure 137. Chub annual gill net CUEs (kgs/km) (harvest + discards) for management area 5-6 (GB08).

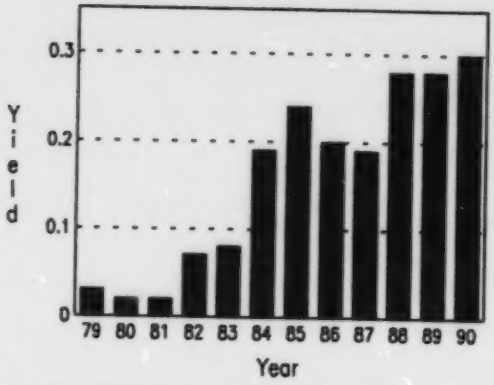

Figure 138. Chub yield (kgs/ha) for management area 5-6 (GB08).

Table 63. Age-class composition of chub caught in gill nets in management area 5-6 (GB06).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0		0	0
2	343	0	179	0		0	0
3	6622	8033	7638	2210		443	0
4	30017	31615	41468	29808	N	2443	10305
5	55081	54193	58224	36532	O	41014	39465
6	18309	49025	29569	47555		149560	172400
7	7827	10348	1583	16390	D	16469	101598
8	2292	1712	82	4900	A	7460	11570
9	1554	823	0	296	T	2819	2665
10	1848	0	0	0	A	0	0
11	173	1364	0	0		0	0
12	471	0	0	0		0	0
13	0	0	0	0		0	0
>13	0	0	0	0		0	0

Note: corrected for discards 1987 onward.

Table 64. CUE-at-age (number/km) for chub caught in gill nets in management area 5-6 (GB03).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00		0.00	0.00
2	1.13	0.00	0.52	0.00		0.00	0.00
3	21.80	24.68	22.30	6.41		1.18	0.00
4	98.84	97.13	121.07	86.45	N	6.49	13.02
5	181.37	166.49	170.00	105.95	O	109.02	46.87
6	60.29	150.61	86.33	137.92		397.55	217.84
7	25.77	31.79	4.62	47.53	D	43.78	128.38
8	7.55	5.26	0.24	14.21	A	19.83	14.62
9	5.12	2.53	0.00	0.86	T	7.49	3.37
10	6.08	0.00	0.00	0.00	A	0.00	0.00
11	0.57	4.19	0.00	0.00		0.00	0.00
12	1.55	0.00	0.00	0.00		0.00	0.00
13	0.00	0.00	0.00	0.00		0.00	0.00
>13	0.00	0.00	0.00	0.00		0.00	0.00

Note: corrected for discards 1987 onward.

LAKE TROUT/BACKCROSS

- Allocation was unchanged at 4,558 kgs.
- The harvest decreased 30% to 3,373 kgs, 74% of the allocation (Figure 139).
- No prediction concerning future abundance for 1991 or 1992.

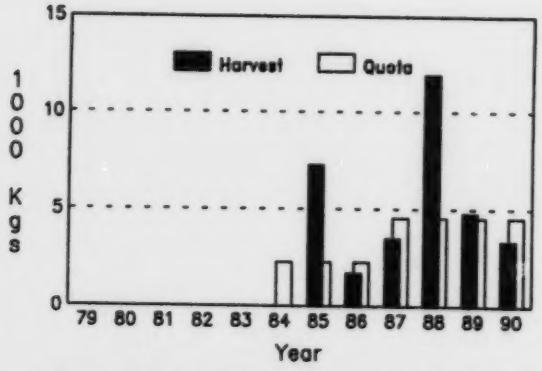

Figure 139. Lake trout/backcross harvest and quota in kilograms for management area 5-6 (GB08).

MANAGEMENT AREA 5-7

GENERAL

- Harvest of all fish species under quota control increased 20% to 24,739 kgs (Table 65). Value of these fish increased 36% to $58,678.
- Harvest and value of the non-quota species is given in Table 66.

Table 65. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-7 (GB09), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	347	308	unlimited	n/a
Chub	19135	11167	11592	96.3
Lake Trout	2600	737	745	98.9
Lake Whitefish	14976	6446	14346	44.9
Northern Pike	1184	435	630	69.0
Pink Salmon	0	0	543	0.0
Sturgeon	401	132	318	41.5
Walleye	4337	1320	1590	83.0
Yellow Perch	15698	4194	8729	48.0
Total	58678	24739		

Table 66. Value ($) and round weight (kgs) by non-quota species for management area 5-7 (GB09), 1990.

Species	Value ($)	Harvest (kgs)
Burbot	871	1718
Carp	2276	2656
Lake Herring	424	506
Rock Bass	0	66
Round Whitefish	66	86
Suckers	0	665
Total	3637	5697

LAKE WHITEFISH

- The allocation dropped 41% to 14,346 kgs.
- The harvest decreased by 2% to 6,446 kgs, 45% of the allocation (Figure 140).
- Gill net effort decreased 10% to 90 kms (Figure 141).
- CUE increased by 10% to 72 kgs/km (Figure 142).
- Apparent increase in abundance may or may not be real.
- Pre-recruit indices in southern Georgian Bay are indicating a trend towards higher abundance (Figure 153, page 105).

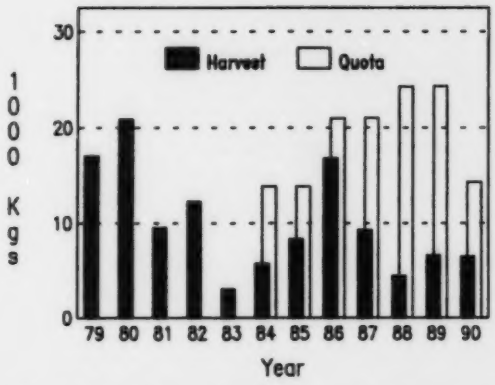

Figure 140. Lake whitefish harvest and quota in kilograms for management area 5-7 (GB09).

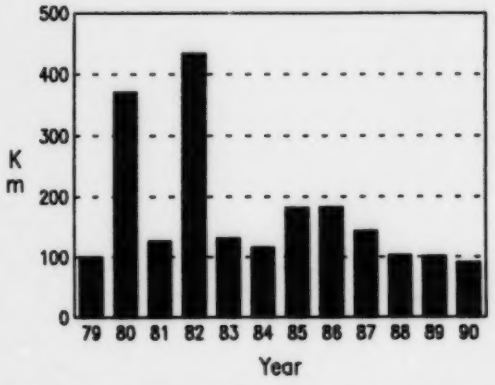

Figure 141. Lake whitefish annual gill net effort (km) for management area 5-7 (GB09).

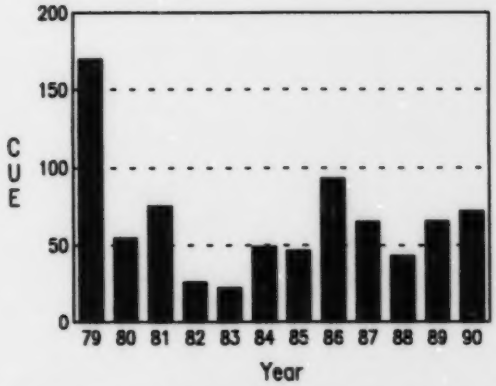

Figure 142. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-7 (GB09).

CHUB

- Allocation increased 10% to 11,592 kgs.
- Harvest increased 13% to 11,167 kgs, 96% of the allocation (Figure 143).
- Effort increased 28% to 97 km (Figure 144).
- CUE decreased 12% to 115 kgs/km (Figure 145).
- Yield was 0.24 kgs/ha (Figure 146).
- Year-class indices indicate that abundance will begin to decline after the very strong 1983 year-class exits the fishery (Figure 158, page 107). CUE data show a decline in abundance, but without catch sampling data we are unable to say whether this is the beginning of the expected decline or a change in fishing practices.
- No prediction concerning future abundance for 1991 or 1992.

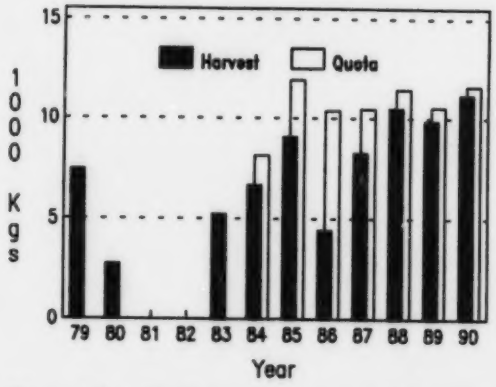

Figure 143. Chub harvest and quota in kilograms for management area 5-7 (GB09).

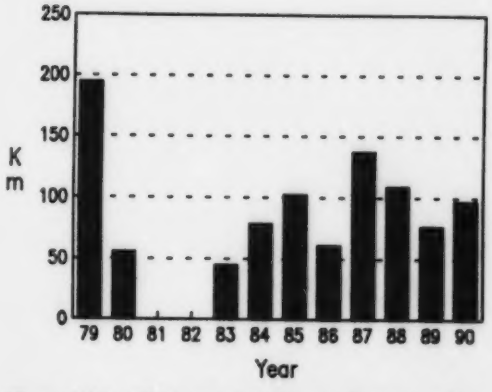

Figure 144. Chub annual gill net effort (km) for management area 5-7 (GB09).

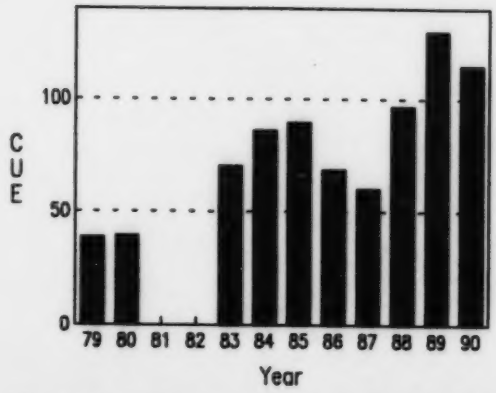

Figure 145. Chub annual gill net CUEs (kgs/km) for management area 5-7 (GB09).

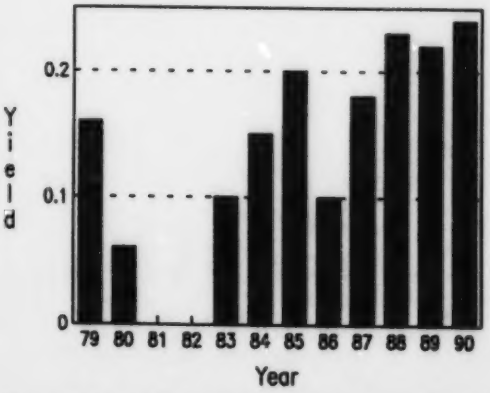

Figure 146. Chub yield (kgs/ha) for management area 5-7 (GB09).

YELLOW PERCH

- Allocation decreased 22% to 8729 kgs.
- Harvest increased 148% to 4,194 kgs, 48% of the allocation (Figure 147).
- Effort increased 186% to 68 km (Figure 148).
- CUE increased 45% to 64 kgs/km (Figure 149).
- No prediction concerning future abundance for 1991 or 1992.

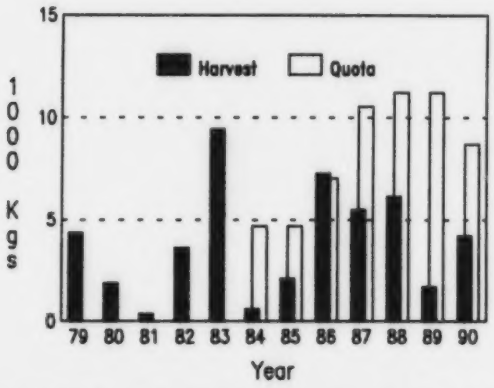

Figure 147. Yellow perch harvest and quota in kilograms for management area 5-7 (GB09).

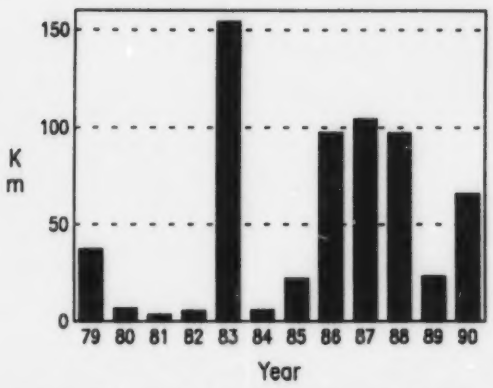

Figure 148. Yellow perch annual gill net effort (km) for management area 5-7 (GB09).

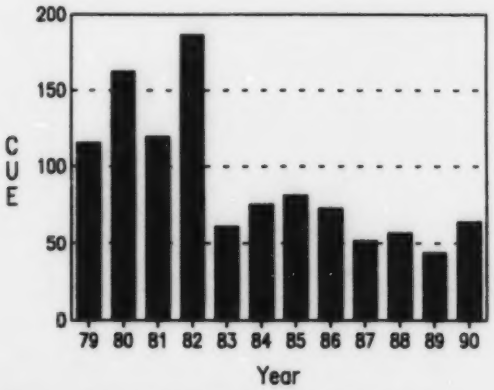

Figure 149. Yellow perch annual gill net CUEs (kgs/km) for management area 5-7 (GB09).

MANAGEMENT AREA 5-8

GENERAL

- Harvest of all fish species under quota control decreased 4% to 29,682 kgs (Table 67). Value of these fish decreased 3% to $68,424.
- Harvest and value of the non-quota species is given in Table 68.

Table 67. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-8 (GB10), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	0	0	0	
Chub	29206	16968	18186	93.3
Lake Trout	16392	4470	4536	98.5
Lake Whitefish	22807	8239	9072	90.8
Northern Pike	0	0	0	
Pink Salmon	0	0	91	0.0
Sturgeon	0	0	0	
Walleye	0	0	0	
Yellow Perch	19	5	2268	0.2
Total	68424	29682		

Table 68. Value ($) and round weight (kgs) by non-quota species for management area 5-8 (GB10), 1990.

Species	Value ($)	Harvest (kgs)
Discarded (mixed)	0	907
Total	0	907

LAKE WHITEFISH

- The allocation remained at 9,072 kgs.
- The harvest increased by 100% to 8,239 kgs, 91% of the allocation (Figure 150).
- Gill net effort increased 45% to 40 kms (Figure 151).
- CUE increased by 37% to 208 kgs/km (Figure 152).
- The reported increase in abundance probably resulted from the recruitment of the strong 1987 year-class.
- Abundance will increase in 1991 and 1992 as the 1987 year-class more fully recruits and the strong 1988 year-class begins to recruit (Figure 153, page 105).

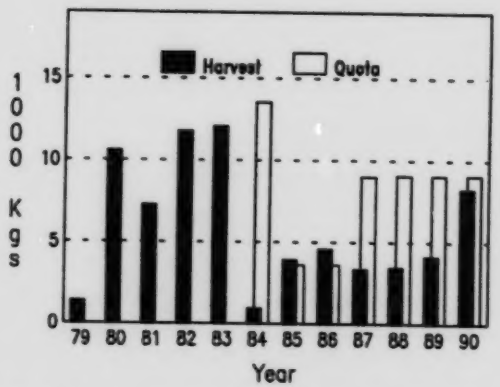

Figure 150. Lake whitefish harvest and quota in kilograms for management area 5-8 (GB10).

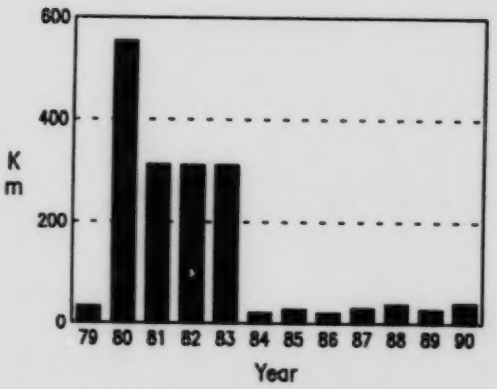

Figure 151. Lake whitefish annual gill net effort (km) for management area 5-8 (GB10).

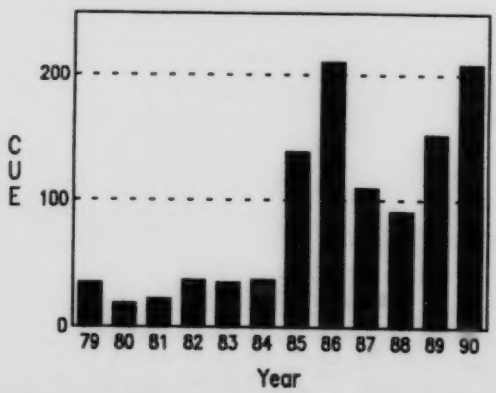

Figure 152. Lake whitefish annual gill net CUEs (kgs/km) for management area 5-8 (GB10).

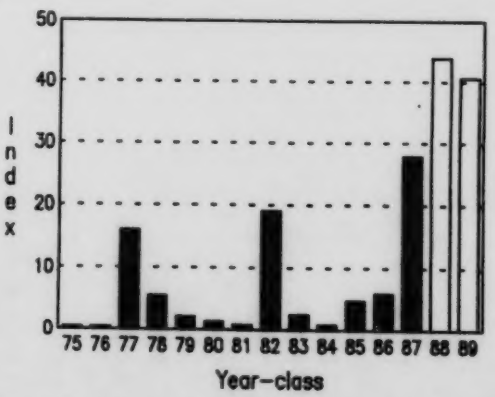

Figure 153. Indices of year-class strength for lake whitefish from index gillnetting in assessment area GB10 (subarea of management area 5-8).

CHUB

- Allocation increased 10% to 18,186 kgs.
- Harvest decreased 24% to 16,968 kgs, 93% of the allocation (Figure 154).
- Effort was virtually unchanged at 157 km (Figure 155).
- CUE decreased 23% to 108 kgs/km (Figure 156).
- Yield was 0.25 kgs/ha (Figure 157).
- Year-class indices indicate that abundance will begin to decline after the very strong 1983 year-class exits the fishery (Figure 158). CUE data show a decline in abundance, but without catch sampling data we are unable to say whether this is the beginning of the expected decline or a change in fishing practices.
- No prediction concerning future abundance for 1991 or 1992.

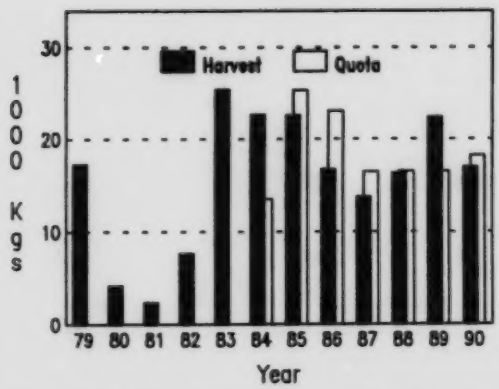

Figure 154. Chub harvest and quota in kilograms for management area 5-8 (GB10).

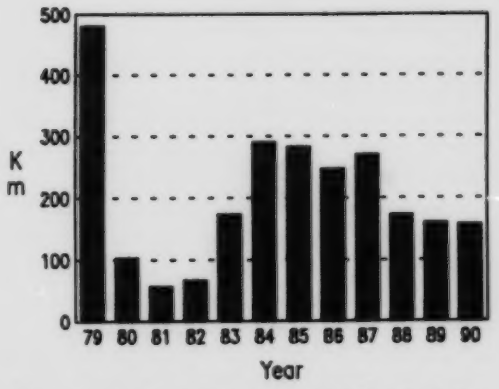

Figure 155. Chub annual gill net effort (km) for management area 5-8 (GB10).

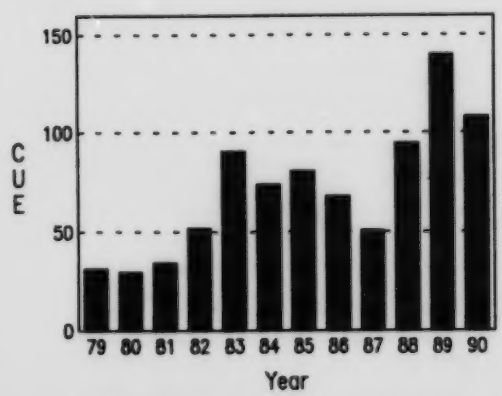

Figure 156. Chub annual gill net CUEs (kgs/km) for management area 5-8 (GB10).

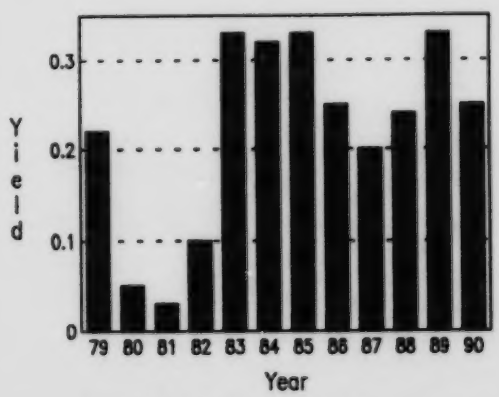

Figure 157. Chub yield (kgs/ha) for management area 5-8 (GB10).

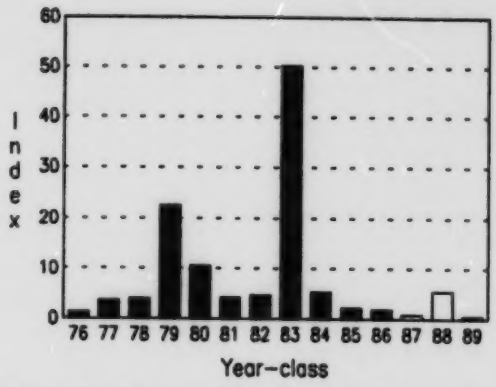

Figure 158. Indices of year-class strength for chub from index gillnetting in assessment area GB10 (subarea of management area 5-8).

LAKE TROUT/BACKCROSS

- Allocation was unchanged at 4,536 kgs.
- The harvest was virtually unchanged at 4,470 kgs, 99% of the allocation (Figure 159).
- Effort increased 34% to 36.3 km (Figure 160).
- CUE decreased 27% to 123 kgs/km (Figure 161).
- Total mortality rates above age 4 remain over 60%, above the recommended 40% guideline.

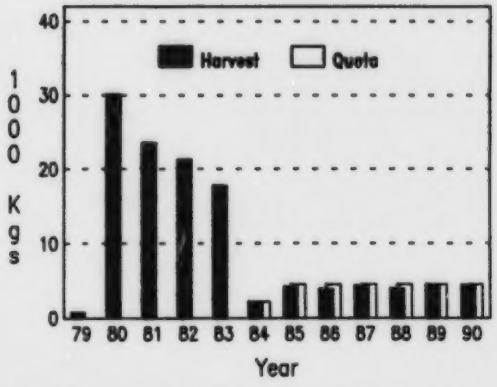

Figure 159. Lake trout/backcross harvest and quota in kilograms for management area 5-8 (GB10).

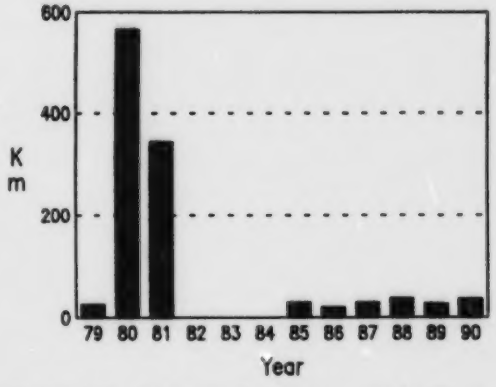

Figure 160. Lake trout/backcross annual gill net effort (km) for management area 5-8 (GB10).

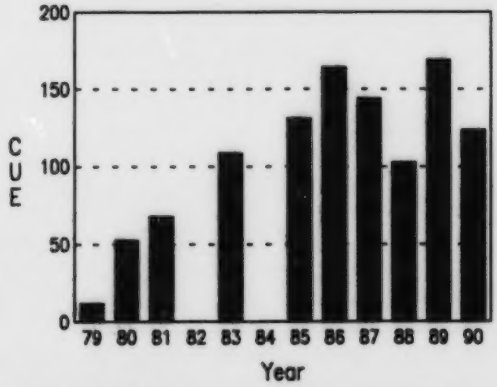

Figure 161. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 5-8 (GB10).

MANAGEMENT AREA 5-9

GENERAL

- Harvest of all fish species under quota control increased 0.3% to 34,936 kgs (Table 69). Value of these fish increased 2% to $64,833.
- Harvest and value of the non-quota species is given in Table 70.

Table 69. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 5-9 (GB11), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	34	66	unlimited	n/a
Chub	15622	9991	9958	100.3
Lake Trout	18639	4818	4937	97.6
Lake Whitefish	30105	19937	40710	49.0
Northern Pike	0	0	0	
Pink Salmon	0	0	270	0.0
Sturgeon	228	85	136	62.5
Walleye	205	39	820	4.6
Yellow Perch	0	0	6867	0.0
Total	64833	34936		

Table 70. Value ($) and round weight (kgs) by non-quota species for management area 5-9 (GB11), 1990.

Species	Value ($)	Harvest (kgs)
Lake Herring	10	6
Round Whitefish	21	41
Total	31	47

LAKE WHITEFISH

- The allocation increased 6% to 40,710 kgs.
- The harvest increased by 7% to 19,937 kgs, 49% of the allocation (Figure 162).
- Gill net effort decreased 13% to 118 kms (Figure 163).
- CUE increased by 23% to 168 kgs/km (Figure 164).
- The reported increase in abundance probably resulted from the recruitment of the strong 1987 year-class.
- Abundance will increase in 1991 and 1992 as the 1987 year-class more fully recruits and the strong 1988 year-class begins to recruit (Figure 153, page 105).

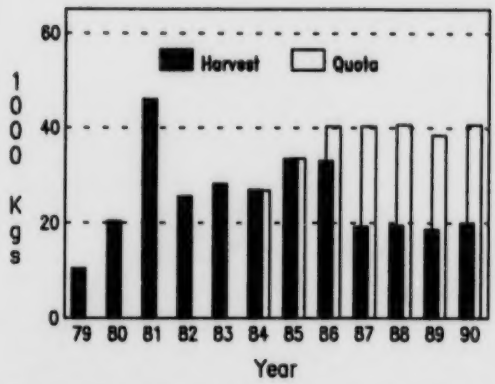

Figure 162. Lake whitefish harvest and quota in kilograms for management area 5-9 (GB11).

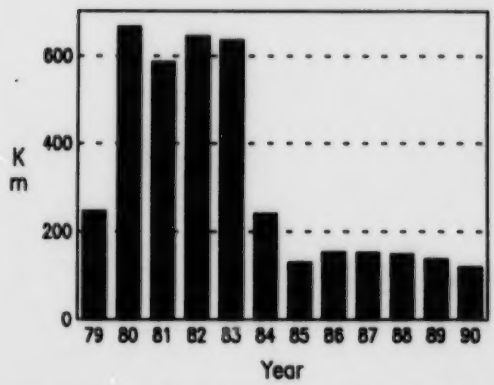

Figure 163. Lake whitefish annual gill net effort (km) for management area 5-9 (GB11).

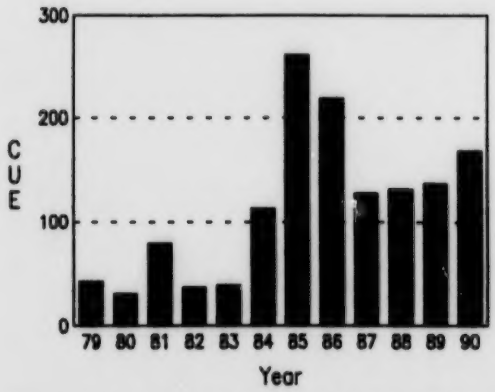

Figure 164. Lake whitefish annual gill net CUEs for management area 5-9 (GB11).

CHUB

- Allocation decreased 12% to 9,958 kgs.
- Harvest decreased 11% to 9,991 kgs, 100% of the allocation (Figure 165).
- Effort decreased 19% to 69 km (Figure 166).
- CUE increased 11% to 146 kgs/km (Figure 167).
- Yield was 0.28 kgs/ha (Figure 168).
- Year-class indices indicate that abundance will begin to decline after the very strong 1983 year-class exits the fishery (Figure 158, page 107). Without catch sampling data we are unable to say when this decline will occur.
- No prediction concerning future abundance for 1991 or 1992.

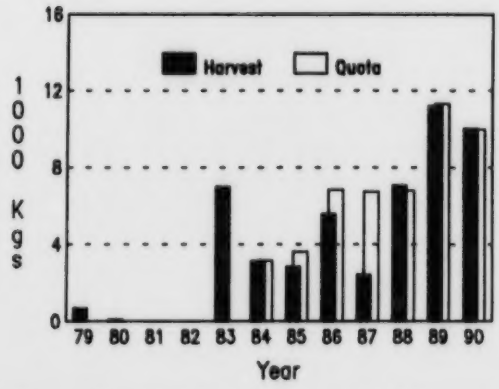

Figure 165. Chub harvest and quota in kilograms for management area 5-9 (GB11).

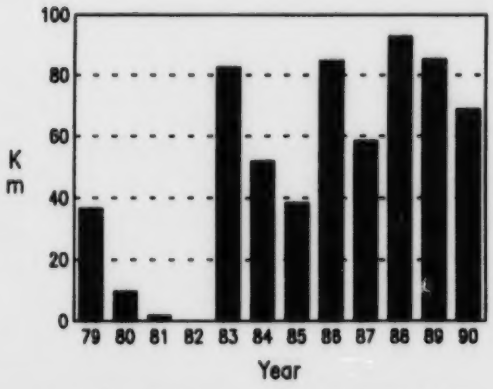

Figure 166. Chub annual gill net effort (km) for management area 5-9 (GB11).

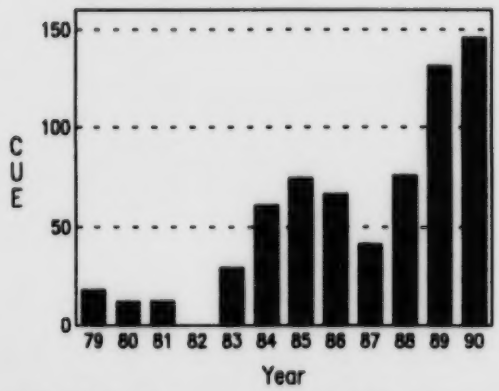

Figure 167. Chub annual gill net CUEs for management area 5-9 (GB11).

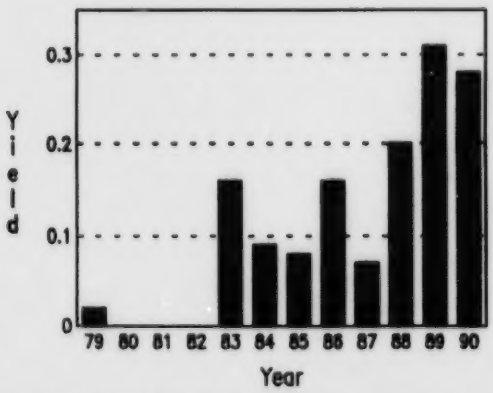

Figure 168. Chub yield (kgs/ha) for management area 5-9 (GB11).

LAKE TROUT/BACKCROSS

- Allocation was unchanged at 4,937 kgs.
- The harvest was virtually unchanged at 4,818 kgs, 98% of the allocation (Figure 169).
- Effort decreased 25% to 80 km (Figure 170).
- CUE increased 40% to 61 kgs/km (Figure 171).
- Total mortality rates above age 4 remain over 60%, above the recommended 40% guideline.

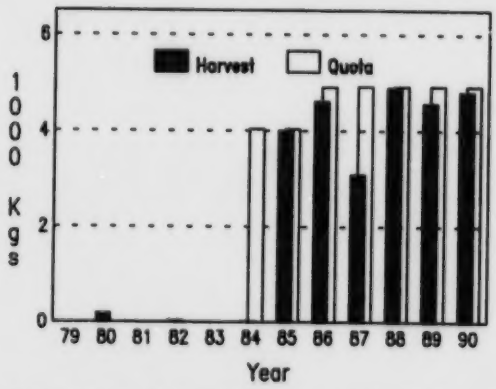

Figure 169. Lake trout/backcross harvest and quota in kilograms for management area 5-9 (GB11).

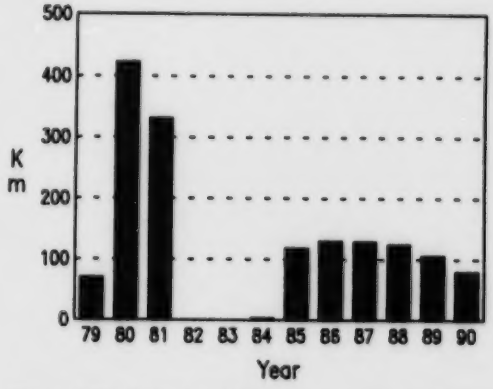

Figure 170. Lake trout/backcross annual gill net effort (km) for management area 5-9 (GB11).

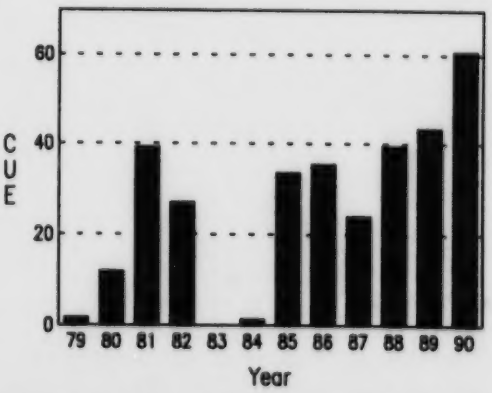

Figure 171. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 5-9 (GB11).

MANAGEMENT AREA 6-1

GENERAL

- Harvest of all fish species under quota control decreased 5% to 194,439 kgs (Table 71). Value of these fish increased 6% to $537,078 .
- Harvest and value of the non-quota species is given in Table 72.

Table 71. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 6-1 (NC01, NC02, NC03), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	289	267	10007	2.7
Chub	228	100	0	*
Lake Trout	15398	5595	7621	73.4
Lake Whitefish	319490	132894	217463	61.1
Northern Pike	13481	6459	18207	35.5
Pink Salmon	1738	999	25494	3.9
Sturgeon	3155	754	7911	9.5
Walleye	53836	12474	21224	58.8
Yellow Perch	129463	34973	70314	49.7
Total	537078	194439		

* division by zero

Table 72. Value ($) and round weight (kgs) by non-quota species for management area 6-1 (NC01, NC02, NC03), 1990.

Species	Value ($)	Harvest (kgs)
Bullhead	265	290
Burbot	0	1310
Carp	734	914
Caviar	0	64
Chinook Salmon	0	211
Crappie	76	46
Gizzard Shad	0	64
Lake Herring	8637	10023
Pacific Salmon	0	40
Rainbow Smelt	11065	25086
Rainbow Trout	0	24
Redhorse	6	17
Rock Bass	0	131
Round Whitefish	2940	3607
Suckers	6588	51155
White Bass	0	4
Discarded (mixed)	4328	36768
Total	34639	129754

LAKE WHITEFISH

- The allocation decreased 10% to 217,463 kgs.
- The harvest dropped 4% to 132,894 kgs, 61% of the allocation (Figure 172, 173, 174). The gill net fishery accounted for 94% of the harvest with the remainder coming out of the trap net fishery.
- Gill net effort was virtually unchanged at 3,013 kms (Figure 175). Trap net increased by 37% to 173 lifts (Figure 176).
- The gill net CUE remained virtually unchanged (Figure 177). The trap net CUE declined 46% (Figure 178). Fishermen have advised of changes in trap net efficiency that might account for this decline.
- Atypically, age 3 fish dominated the catch (Tables 73, 74, 75, 76, 77, 78, 79, 80). Ages 4 through 6 were weakly represented relative to most previous years.
- Abundance did not drop as predicted due to the recruitment of larger than expected numbers of age 3 fish. However, abundance remained low relative to that experienced in the mid 80s.
- Abundance will increase in 1991 with the entry of the 1987 year-class as age 4 fish. These age 4 fish will dominate the catch.

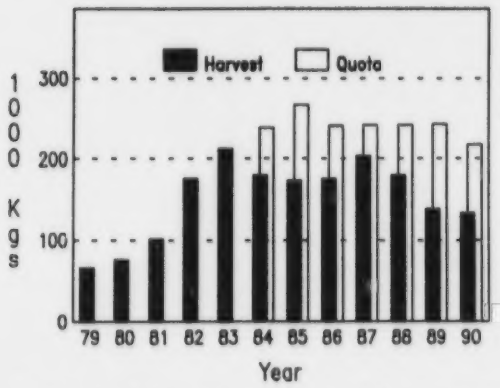

Figure 172. Lake whitefish harvest and quota (kgs) for management area 6-1 (NC01, NC02, NC03).

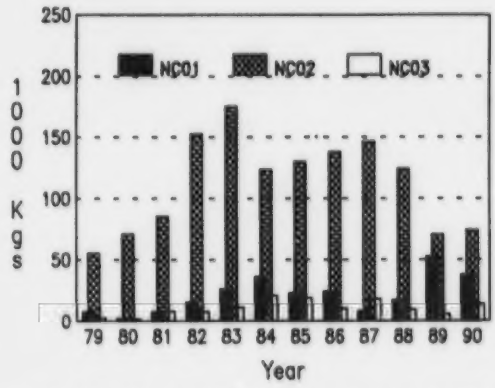

Figure 173. Lake whitefish gill net harvest (kgs) for management area 6-1 (NC01,NC02,NC03).

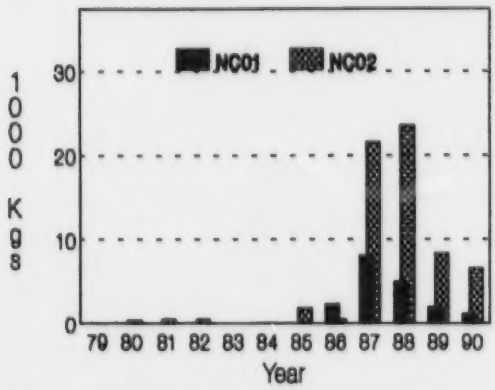

Figure 174. Lake whitefish trap net harvest (kgs) for management area 6-1 (NC01,NC02,NC03).

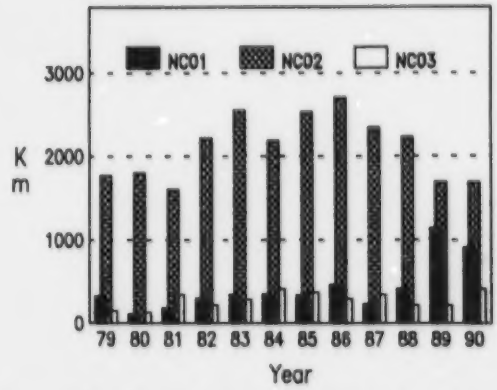

Figure 175. Lake whitefish gill net effort (km) for management area 6-1 (NC01,NC02,NC03).

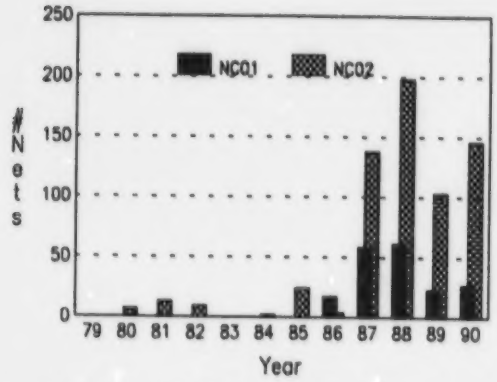

Figure 176. Lake whitefish trap net effort by area for management area 6-1 (NC01,NC02,NC03).

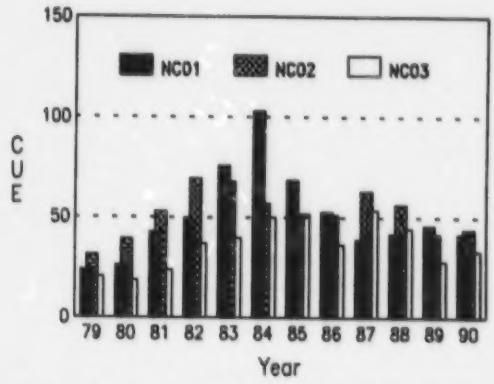

Figure 177. Lake whitefish gill net CUES (kgs/km) by area for management area 6-1 (NC01, NC02, NC03).

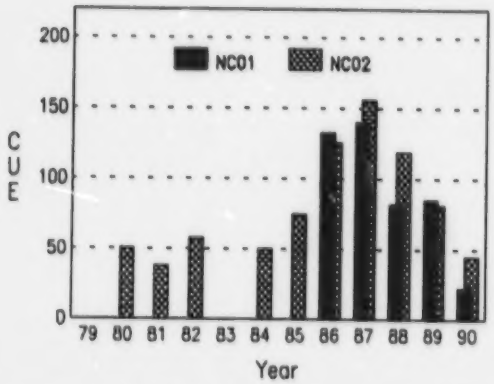

Figure 178. Lake whitefish trap net CUEs (kgs/net) for management area 6-1 (NC01,NC02,NC03).

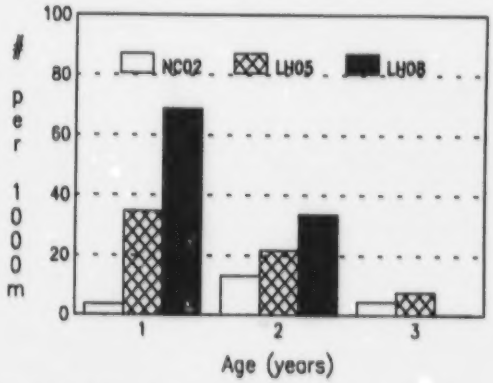

Figure 179. Lake whitefish CUEs from index fishing in assessment area NC02, relative to CUEs from similar gear in Lake Huron.

Table 73. Age-class composition of lake whitefish caught in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1990
1	0
2	0
3	104
4	2192
5	2923
6	6681
7	5637
8	3236
9	2297
10	2714
11	209
12	0
13	104
>13	0

Table 74. Age-class composition of lake whitefish caught in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	243	94
3	2046	2195	419	0	2231	7128	4617	5183	3591	2762	9679	19876
4	8554	19194	25125	7325	9670	26303	28152	55283	22841	29131	6504	14573
5	12236	6465	14844	79375	44748	21501	28626	23657	38994	30001	17071	5463
6	8494	8662	4511	7025	50912	13942	14971	10063	13888	17101	8976	5922
7	2386	10926	5245	3011	5458	9598	8711	3225	3741	4804	3571	3323
8	561	2213	1784	1806	1114	1621	4280	834	1470	750	767	1018
9	279	536	106	1505	1114	897	557	371	180	0	313	425
10	293	85	210	0	320	411	495	212	30	0	179	284
11	239	85	106	301	0	637	434	82	30	0	0	0
12	14	0	0	0	0	215	743	0	0	0	0	0
13	94	85	106	0	0	0	0	0	0	0	0	0
>13	14	0	0	0	0	108	186	0	0	0	0	0

Table 75. Age-class composition of harvested lake whitefish caught in trap nets in assessment area NC02 (subarea of management area 6-1).

AGE	1987	1988	1989	1990
1	0	0	0	0
2	0	101	66	351
3	204	663	617	2916
4	3089	5997	779	1186
5	5416	8080	2030	786
6	4828	3399	1969	1043
7	2304	709	612	365
8	548	936	154	274
9	0	0	245	239
10	0	0	48	286
11	0	0	0	36
12	47	0	10	0
13	0	0	0	6
>13	0	0	0	0

Table 76. Age-class composition of lake whitefish caught in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	
2	7	0	0	0	0	0	
3	2306	1676	479	764	59	567	
4	5697	6754	4225	7510	2773	680	N
5	9687	2242	1719	8741	2408	823	O
6	4085	1157	332	5590	452	677	
7	1898	413	408	960	118	450	D
8	505	184	68	714	0	129	A
9	472	106	0	345	0	242	T
10	472	47	0	0	59	66	A
11	232	28	0	0	0	0	
12	0	18	0	0	0	0	
13	232	0	0	0	0	0	
>13	0	18	0	0	0	0	

Table 77. CUE-at-age (number/km) for lake whitefish caught in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1990
1	0.00
2	0.00
3	0.11
4	2.41
5	3.21
6	7.34
7	6.20
8	3.56
9	2.52
10	2.98
11	0.23
12	0.00
13	0.11
>13	0.00

Table 78. CUE-at-age (number/km) for lake whitefish caught in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.06
3	1.16	1.22	0.26	0.00	0.88	3.28	1.83	1.92	1.54	1.24	5.72	11.77
4	4.85	10.65	15.60	3.33	3.80	12.10	11.16	20.48	9.81	13.13	3.85	8.63
5	6.93	3.59	9.22	36.09	17.59	9.89	11.35	8.77	16.75	13.52	10.09	3.23
6	4.81	4.81	2.80	3.19	20.01	6.41	5.93	3.73	5.96	7.71	5.31	3.51
7	1.35	6.06	3.26	1.37	2.14	4.42	3.45	1.19	1.61	2.17	2.11	1.97
8	0.32	1.23	1.11	0.82	0.44	0.75	1.70	0.31	0.63	0.34	0.45	0.60
9	0.16	0.30	0.07	0.68	0.44	0.41	0.22	0.14	0.08	0.00	0.19	0.25
10	0.17	0.05	0.13	0.00	0.13	0.19	0.20	0.08	0.01	0.00	0.11	0.17
11	0.14	0.05	0.07	0.14	0.00	0.29	0.17	0.03	0.01	0.00	0.00	0.00
12	0.01	0.00	0.00	0.00	0.00	0.10	0.29	0.00	0.00	0.00	0.00	0.00
13	0.05	0.05	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>13	0.01	0.00	0.00	0.00	0.00	0.05	0.07	0.00	0.00	0.00	0.00	0.00

Table 79. CUE-at-age (number/net) for harvested lake whitefish caught in trap nets in assessment area NC02 (subarea of management area 6-1).

AGE	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00
2	0.00	0.51	0.64	2.41
3	1.48	3.35	5.99	19.97
4	22.38	30.29	7.56	8.12
5	39.25	40.81	19.71	5.38
6	34.99	17.17	19.12	7.14
7	16.70	3.58	5.94	2.50
8	3.97	4.73	1.50	1.88
9	0.00	0.00	2.38	1.64
10	0.00	0.00	0.47	1.96
11	0.00	0.00	0.00	0.25
12	0.34	0.00	0.10	0.00
13	0.00	0.00	0.00	0.04
>13	0.00	0.00	0.00	0.00

Table 80. CUE-at-age (number/km) for lake whitefish caught in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	
2	0.02	0.00	0.00	0.00	0.00	0.00	
3	5.58	4.56	1.64	2.26	0.28	2.60	
4	13.78	18.37	14.49	22.17	13.01	3.12	N
5	23.44	6.10	5.90	25.81	11.29	3.78	O
6	9.88	3.15	1.14	16.50	2.12	3.11	
7	4.59	1.12	1.40	2.83	0.55	2.07	D
8	1.22	0.50	0.23	2.11	0.00	0.59	A
9	1.14	0.29	0.00	1.02	0.00	1.11	T
10	1.14	0.13	0.00	0.00	0.28	0.30	A
11	0.56	0.08	0.00	0.00	0.00	0.00	
12	0.00	0.05	0.00	0.00	0.00	0.00	
13	0.56	0.00	0.00	0.00	0.00	0.00	
>13	0.00	0.05	0.00	0.00	0.00	0.00	

YELLOW PERCH

- Allocation decreased 10% to 70,314 kgs.
- Harvest increased 16% to 34,973 kgs, 50% of the allocation (Figure 180). Most of the harvest came out of NC03 (75%) (Figure 181).
- Effort decreased slightly to 729.1 km (Figure 182).
- CUE increased 19% (Figure 183).
- The age-classes 3 to 6 dominate the fishery in both NC02 and NC03 (Tables 81,82). Age 3 is more prominant in the NC03 fishery (Tables 83,84), perhaps a result of mesh size differences.
- Earlier recruitment of the 1987 year-class (not expected until 1991) accounts for the increase in abundance in 1990.
- Abundance will increase further in 1991 as the 1987 year-class continues to recruit to the fishery. As abundance in 1992 will depend heavily on carry-over of the 1987 year-class (Figure 184), we are unable to make any prediction at this time.

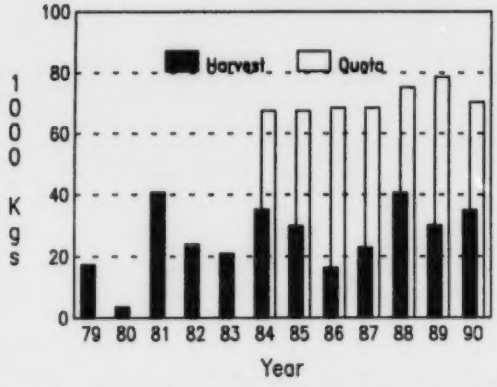

Figure 180. Yellow perch harvest and quota (kgs) for management area 6-1 (NC01, NC02, NC03).

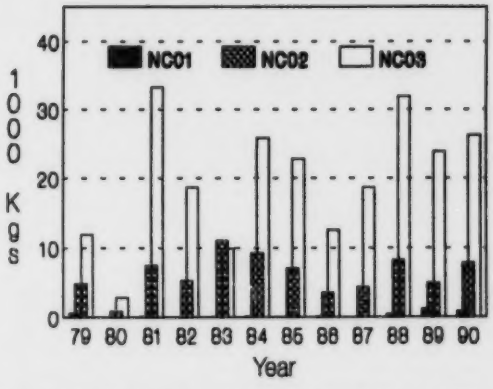

Figure 181. Yellow perch harvest (kgs) by area for management area 6-1 (NC01,NC02,NC03).

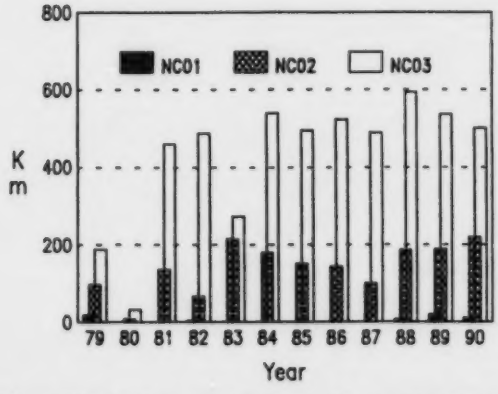

Figure 182. Yellow perch annual gill net effort (km) by area for management area 6-1 (NC01,NC02,NC03).

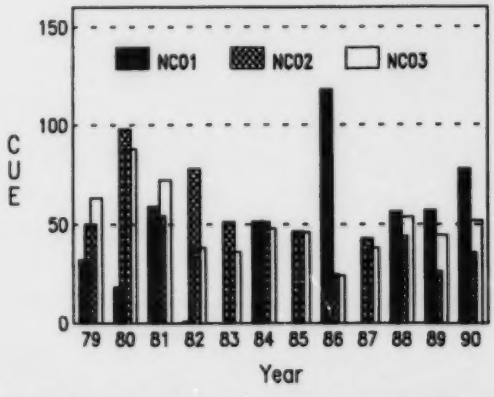

Figure 183. Yellow perch annual gill net CUES (kgs/km) for management area 6-1 (NC01,NC02,NC03).

Table 81. Age-class composition of yellow perch caught in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0	0	0	0	0	0	0
2	0	0	0	0	0	702	138
3	780	2511	155	7	0	1681	4715
4	7289	6338	1844	237	1608	4005	9445
5	19283	12020	4658	3440	7570	9995	13771
6	9436	11490	5794	9734	16532	4955	8040
7	4806	3927	4164	6971	13163	3816	2642
8	923	305	1581	1667	887	1271	2172
9	71	159	30	0	733	274	327
10	0	0	0	61	0	176	107
11	0	0	0	61	0	0	0
12	0	0	0	0	0	196	0
13	0	0	124	0	0	0	0
>13	0	0	0	0	0	0	0

Table 82. Age-class composition of yellow perch caught in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0			0	0	0	0	0	0
2	0			0	0	0	0	903	1442
3	801			2689	2348	260	4046	25477	81321
4	3743	N	N	18467	11713	41026	28208	70650	26633
5	7432	O	O	40268	12121	34846	69761	21365	22621
6	28065			28373	14583	7743	30046	12609	6128
7	29757	D	D	4100	12080	6444	7129	2822	3781
8	8356	A	A	4316	2363	915	1896	433	742
9	385	T	T	1937	258	632	2594	282	0
10	0	A	A	1452	269	0	0	0	0
11	0			753	0	0	0	0	0
12	0			0	179	0	0	0	0
13	0			0	0	0	0	0	0
>13	0			0	0	0	0	0	0

Table 83. CUE-at-age (number/km) for yellow perch caught in gill nets in assessment area NC02 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	3.74	0.63
3	4.34	16.68	1.09	0.07	0.00	8.95	21.54
4	40.54	42.11	12.94	2.37	8.60	21.33	43.15
5	107.25	79.87	32.69	34.33	40.48	53.22	62.91
6	52.48	76.35	40.66	97.15	88.41	26.38	36.73
7	26.73	26.09	29.22	69.57	70.39	20.32	12.07
8	5.13	2.03	11.09	16.64	4.74	6.77	9.92
9	0.39	1.06	0.21	0.00	3.92	1.46	1.50
10	0.00	0.00	0.00	0.61	0.00	0.94	0.49
11	0.00	0.00	0.00	0.61	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	1.04	0.00
13	0.00	0.00	0.87	0.00	0.00	0.00	0.00
>13	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 84. CUE-at-age (number/km) for yellow perch caught in gill nets in assessment area NC03 (subarea of management area 6-1).

AGE	1982	1983	1984	1985	1986	1987	1988	1989	1990
1	0.00			0.00	0.00	0.00	0.00	0.00	0.00
2	0.00			0.00	0.00	0.00	0.00	1.69	2.89
3	1.65			5.46	4.50	0.53	6.81	47.62	162.90
4	7.70	N	N	37.47	22.47	84.09	47.49	132.06	53.35
5	15.29	O	O	81.70	23.25	71.42	117.44	39.93	45.31
6	57.74			57.56	27.97	15.87	50.58	23.57	12.28
7	61.22	D	D	8.32	23.17	13.21	12.00	5.27	7.57
8	17.19	A	A	8.76	4.53	1.88	3.19	0.81	1.49
9	0.79	T	T	3.93	0.49	1.30	4.37	0.53	0.00
10	0.00	A	A	2.95	0.52	0.00	0.00	0.00	0.00
11	0.00			1.53	0.00	0.00	0.00	0.00	0.00
12	0.00			0.00	0.34	0.00	0.00	0.00	0.00
13	0.00			0.00	0.00	0.00	0.00	0.00	0.00
>13	0.00			0.00	0.00	0.00	0.00	0.00	0.00

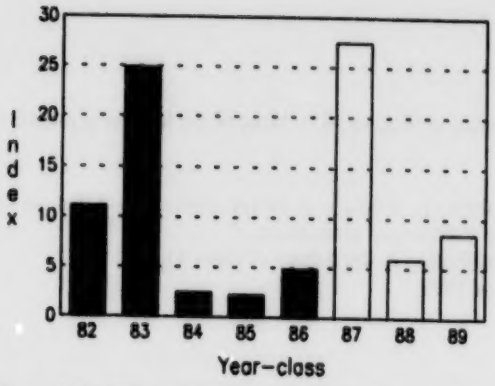

Figure 184. Indices of year-class strength for yellow perch from index gillnetting in assessment area NC03 (subarea of management area 6-1).

WALLEYE

- Allocation decreased 5% to 21,224 kgs.
- Harvest decreased 24% to 12,474 kgs, 59% of the allocation (Figure 185). Most of the harvest occurred in NC01 (64%) (Figure 186).
- Effort decreased 65% to 318 km (Figure 187).
- CUE increased 120% (Figure 188). However, our inability to isolate gear set for walleye from that set for other species, limits the reliance we can place on CUE as an indicator of abundance.
- The stock is fairly stable with over 12 age-classes contributing to the fishery (Tables 85,86).
- No prediction concerning future abundance for 1991 or 1992.

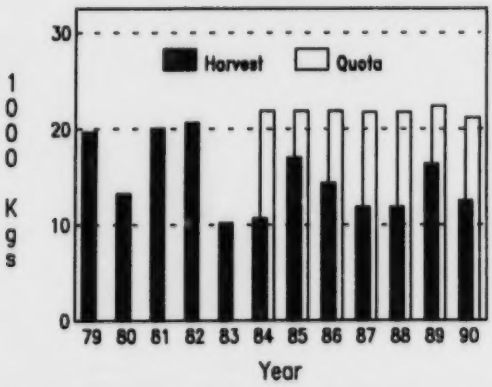

Figure 185. Walleye harvest and quota in kilograms for management area 6-1 [NC01, NC02, NC03].

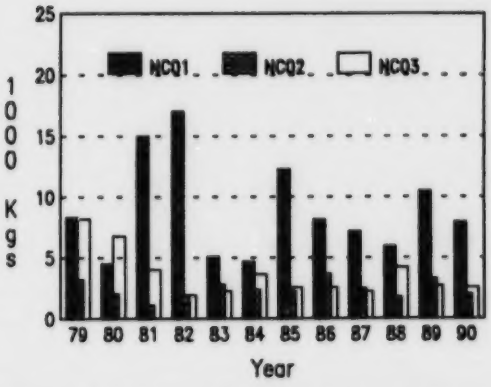

Figure 186. Walleye harvest in kilograms for management area 6-1 (NC01, NC02, NC03).

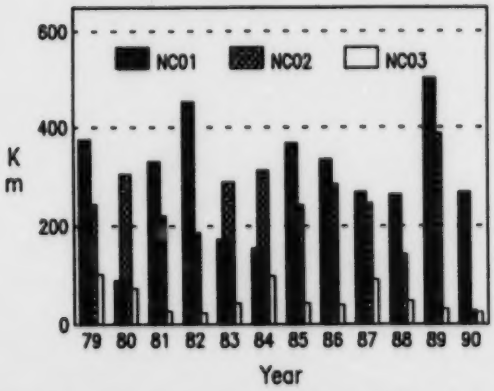

Figure 187. Walleye annual gill net effort (km) for management area 6-1 (NC01, NC02, NC03).

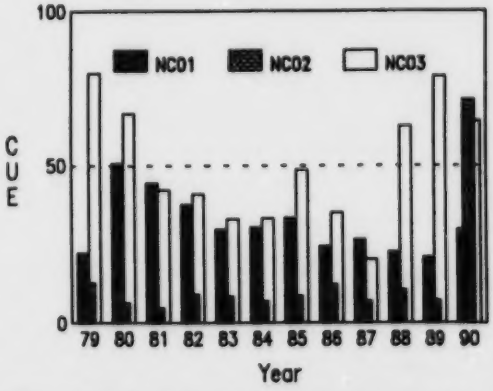

Figure 188. Walleye gill net CUEs (kgs/km) for management area 6-1 (NC01, NC02, NC03).

Table 85. Age-class composition of walleye caught in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0	0	0		0	0	0
2	0	0	0		94	0	29
3	0	0	0		0	37	0
4	82	317	15	N	436	53	351
5	418	1563	583	O	578	1183	556
6	857	1635	1230		1607	597	1552
7	621	2800	1647	D	891	1684	351
8	267	1635	1431	A	245	1012	937
9	196	560	473	T	65	520	322
10	163	164	96	A	8	728	176
11	225	164	52		125	297	88
12	132	36	46		27	332	117
13	76	81	133		6	148	176
>13	148	81	0		15	73	29

Table 86. CUE-at-age of walleye caught in gill nets in assessment area NC01 (subarea of management area 6-1).

AGE	1984	1985	1986	1987	1988	1989	1990
1	0.00	0.00	0.00		0.00	0.00	0.00
2	0.00	0.00	0.00		0.36	0.00	0.11
3	0.00	0.00	0.00		0.00	0.07	0.00
4	0.54	0.86	0.04	N	1.66	0.11	1.31
5	2.73	4.25	1.74	O	2.20	2.35	2.08
6	5.60	4.45	3.68		6.12	1.19	5.79
7	4.06	7.61	4.93	D	3.39	3.35	1.31
8	1.74	4.45	4.28	A	0.93	2.01	3.50
9	1.28	1.52	1.41	T	0.25	1.03	1.20
10	1.06	0.45	0.29	A	0.03	1.45	0.66
11	1.47	0.45	0.16		0.48	0.59	0.33
12	0.86	0.10	0.14		0.10	0.66	0.44
13	0.50	0.22	0.40		0.02	0.29	0.66
>13	0.97	0.22	0.00		0.06	0.15	0.11

LAKE TROUT/BACKCROSS

- Allocation increased 44% to 7,621 kgs.
- Harvest increased 21% to 5,595 kgs, 73% of the allocation (Figure 189). Most of the harvest occurred in areas NC02 and NC03 (Figure 190).
- CUE is given by assessment area in Figure 191.
- No prediction concerning future abundance for 1991 or 1992.

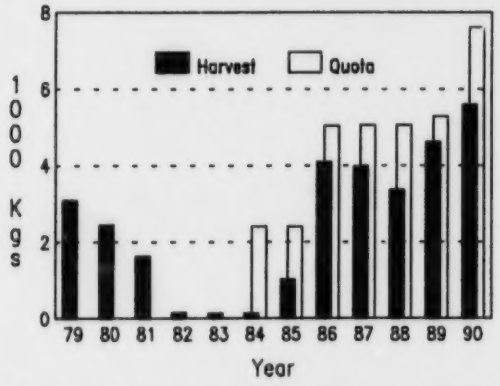

Figure 189. Lake trout/backcross harvest and quota (kgs) for management area 6-1 (NC01,NC02,NC03).

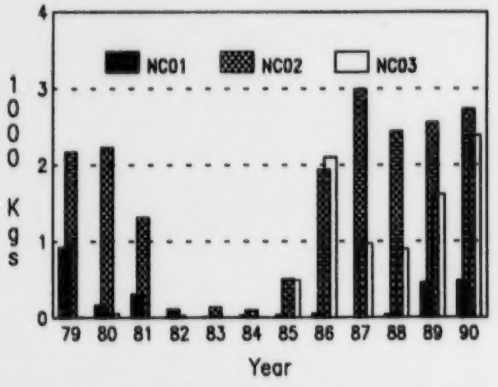

Figure 190. Lake trout/backcross harvest (kgs) by area for management area 6-1 (NC01,NC02,NC03).

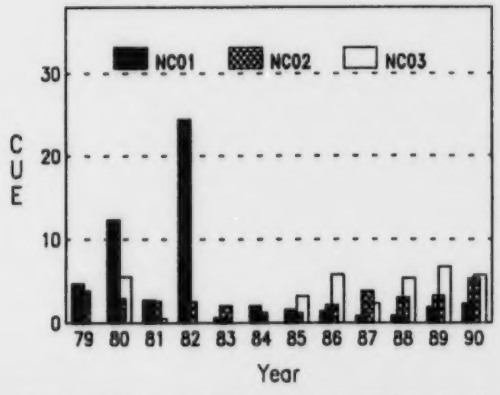

Figure 191. Lake trout/backcross gill net CUEs (kg/km) by area for management area 6-1 (NC01,NC02,NC03).

NORTHERN PIKE

- Allocation decreased 4% to 18,207 kgs.
- Harvest increased marginally to 6,459 kgs, 36% of the allocation (Figure 192).
- No prediction concerning future abundance for 1991 or 1992.

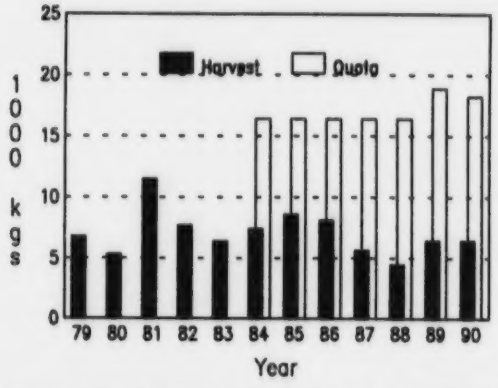

Figure 192. Northern pike harvest and quota (kgs) for management area 6-1 (NC01, NC02, NC03).

PINK SALMON

- Allocation decreased 65% to 25,494 kgs.
- Harvest decreased 82% to 999 kgs, 4% of the allocation (Figure 193).
- No prediction concerning future abundance for 1991 or 1992.

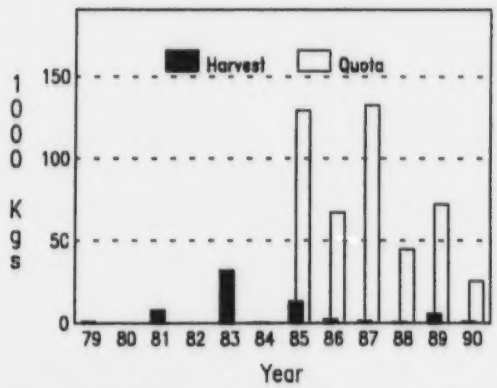

Figure 193. Pink salmon harvest and quota in kilograms for management area 6-1 (NC01, NC02, NC03).

MANAGEMENT AREA 6-2

GENERAL

- Harvest of all fish species under quota control decreased 19% to 11,919 kgs (Table 87). Value of these fish decreased 11% to $36,009.
- Harvest and value of the non-quota species is given in Table 88.

Table 87. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 6-2 (NC04). 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	0	0	455	0.0
Chub	0	0	0	
Lake Trout	4458	1532	114	1343.9
Lake Whitefish	6986	2956	114	2593.0
Northern Pike	443	249	522	47.7
Pink Salmon	0	0	379	0.0
Sturgeon	0	0	0	
Walleye	0	0	0	
Yellow Perch	24122	7123	2602	273.8
Total	36009	11919		

Table 88. Value ($) and round weight (kgs) by non-quota species for management area 6-2 (NC04). 1990.

Species	Value ($)	Harvest (kgs)
Bullhead	0	4
Burbot	0	440
Carp	0	14
Crappie	0	4
Gizzard Shad	0	135
Lake Herring	947	738
Rock Bass	0	325
Round Whitefish	28	18
Suckers	0	3423
Discarded (mixed)	0	378
Total	975	5489

LAKE WHITEFISH

- The allocation was 114 kgs.
- The harvest increased 14% to 2,956 kgs (Figure 194).
- Gill net effort increased 39% to 81 kms (Figure 195).
- CUE decreased 17% to 36 kgs/km (Figure 196).
- See management area 6-1 for commentary on North Channel lake whitefish.

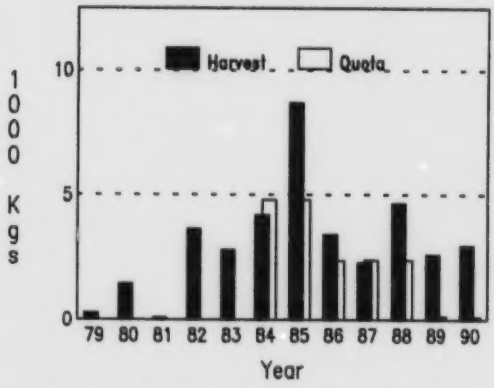

Figure 194. Lake whitefish harvest and quota in kilograms for management area 6-2 (NC04).

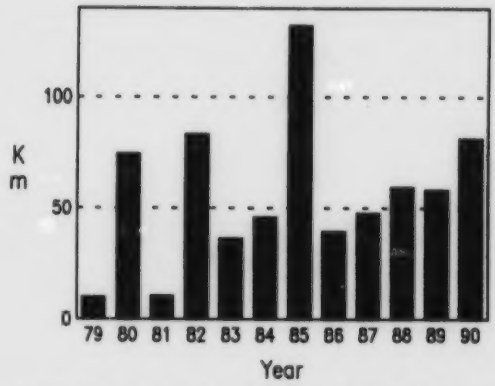

Figure 195. Lake whitefish annual gill net effort (km) for management area 6-2 (NC04).

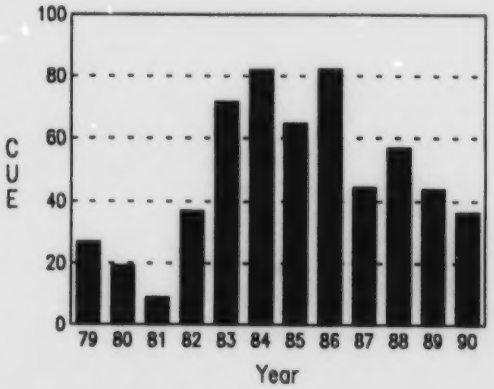

Figure 196. Lake whitefish annual gill net CUEs (kgs/km) for management area 6-2 (NC04).

YELLOW PERCH

- Allocation remained unchanged at 2,602 kgs.
- Harvest decreased 20% to 7,123 kgs, 274% of the allocation (Figure 197). Fishermen are allowed to take part of their 6-1 quota in 6-2.
- Effort increased 30% to 98 km (Figure 198).
- CUE decreased 47% to 72 kg/km (Figure 199).
- No age composition data.
- Abundance should increase as suggested in the 6-1 commentary.

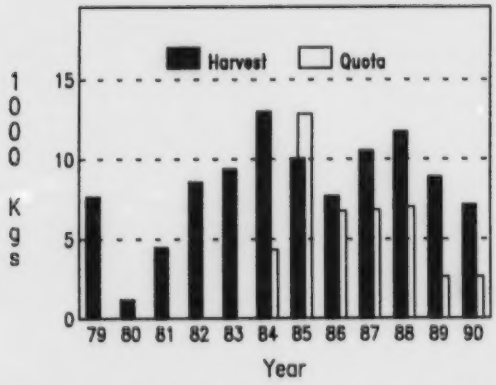

Figure 197. Yellow perch harvest and quota in kilograms for management area 6-2 (NC04).

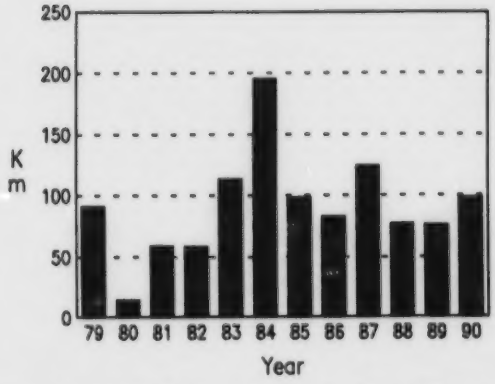

Figure 198. Yellow perch annual gill net effort (km) for management area 6-2 (NC04).

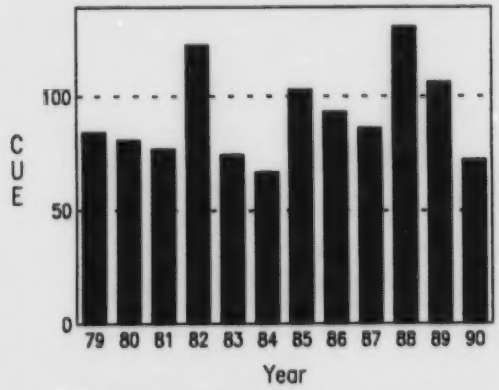

Figure 199. Yellow perch annual gill net CUEs (kgs/km) for management area 6-2 (NC04).

LAKE TROUT/BACKCROSS

- Allocation was unchanged at 114 kgs.
- Harvest increased 26% to 1,532 kgs, 1344% of the allocation (Figure 200).
- CUE decreased 37% to 12 kgs/km (Figure 201).
- No prediction concerning future abundance for 1991 or 1992.

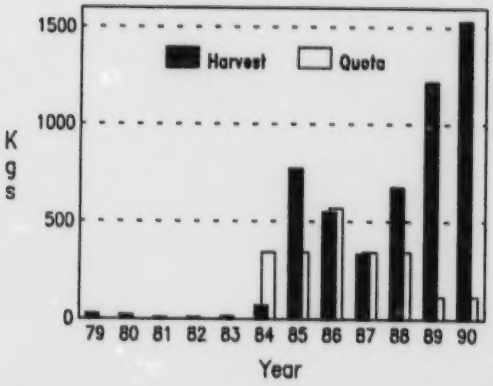

Figure 200. Lake trout/backcross harvest and quota in kilograms for management area 6-2 (NC04).

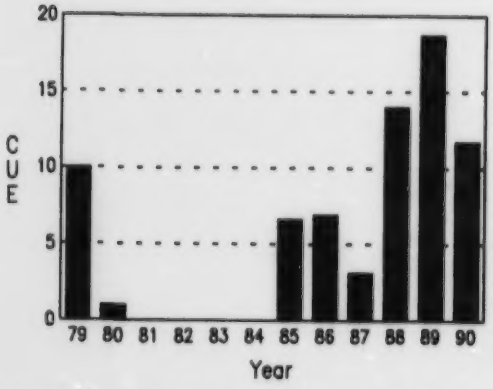

Figure 201. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 6-2 (NC04).

MANAGEMENT AREA 6-3

GENERAL

- Harvest of all fish species under quota control increased 72% to 3,086 kgs (Table 89). Value of these fish increased 131% to $7,417.
- Harvest and value of the non-quota species is given in Table 90.

Table 89. Value ($), round weight (kgs), quota (kgs) and percent quota taken by quota species for management area 6-3 (NC05), 1990.

Species	Value ($)	Harvest (kgs)	Quota (kgs)	% Quota Taken
Channel Catfish	28	26	227	11.5
Chub	0	0	0	0.0
Lake Trout	1472	553	774	71.4
Lake Whitefish	5917	2507	4047	61.9
Northern Pike	0	0	400	0.0
Pink Salmon	0	0	0	0.0
Sturgeon	0	0	0	0.0
Walleye	0	0	0	0.0
Yellow Perch	0	0	1181	0.0
Total	7417	3086		

Table 90. Value ($) and round weight (kgs) by non-quota species for management area 6-3 (NC05), 1990.

Species	Value ($)	Harvest (kgs)
Carp	0	126
Lake Herring	0	143
Round Whitefish	0	7
Discarded (mixed)	0	116
Total	0	392

LAKE WHITEFISH

- The allocation decreased 17% to 4,047 kgs.
- The harvest increased 300% to 2,507 kgs (Figure 202).
- Gill net effort increased 1300% to 15 kms (Figure 203).
- CUE decreased 78% to 169 kgs/km (Figure 204).
- Extreme fluctuations in harvest and effort preclude using CUE as an indicator of abundance.
- No comment on future abundance.

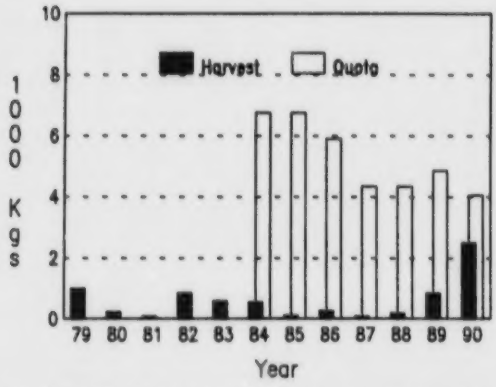

Figure 202. Lake whitefish harvest and quota in kilograms for management area 6-3 (NC05).

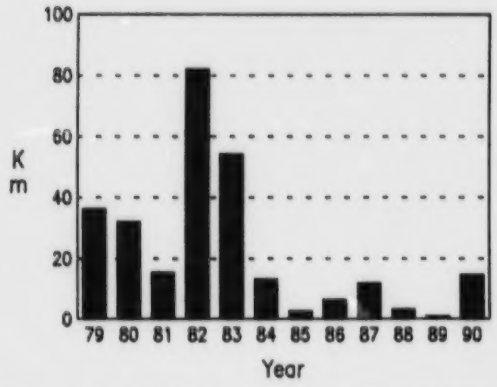

Figure 203. Lake whitefish annual gill net effort (km) for management area 6-3 (NC05).

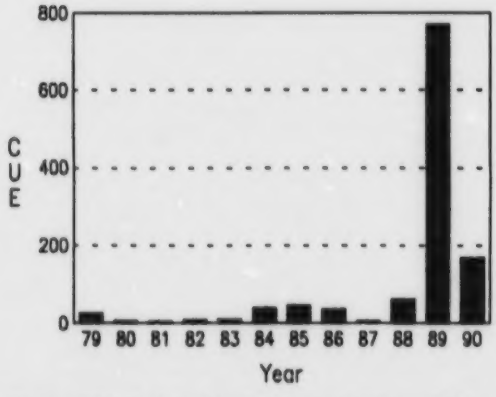

Figure 204. Lake whitefish annual gill net CUEs (kgs/km) for management area 6-3 (NC05).

YELLOW PERCH

- Allocation decreased 5% to 1,181 kgs.
- No harvest in 1990 (Figure 205).

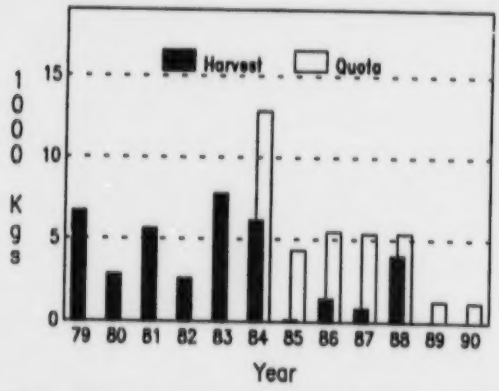

Figure 205. Yellow perch harvest and quota in kilograms for management area 6-3 (NC05).

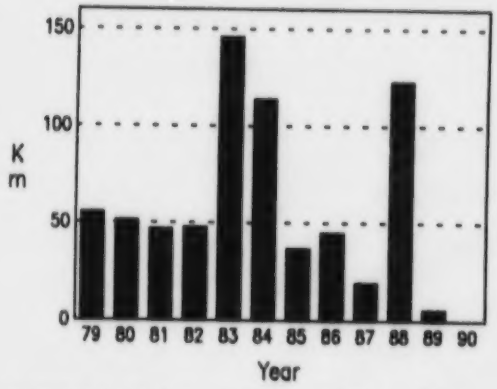

Figure 206. Yellow perch annual gill net effort (km) for management area 6-3 (NC05).

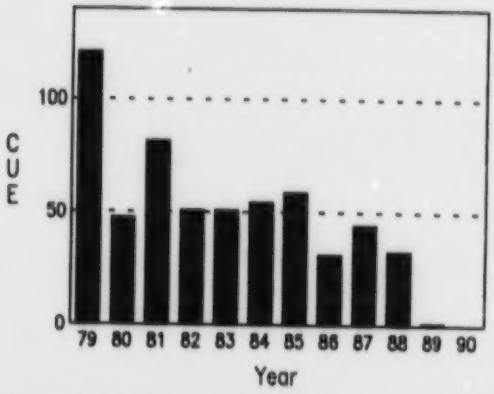

Figure 207. Yellow perch annual gill net CUEs (kgs/km) for management area 6-3 (NC05).

LAKE TROUT/BACKCROSS

- Allocation decreased 12% to 774 kgs.
- Harvest decreased 41% to 553 kgs, 71% of the allocation (Figure 208).

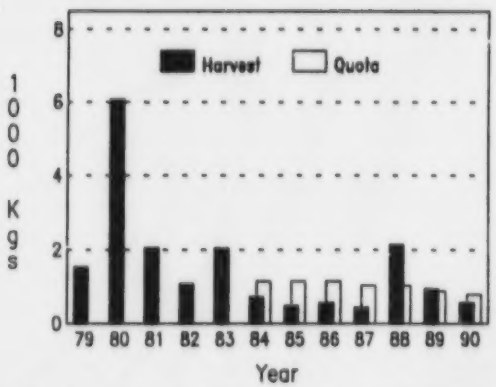

Figure 208. Lake trout/backcross harvest and quota in kilograms for management area 6-3 (NC05).

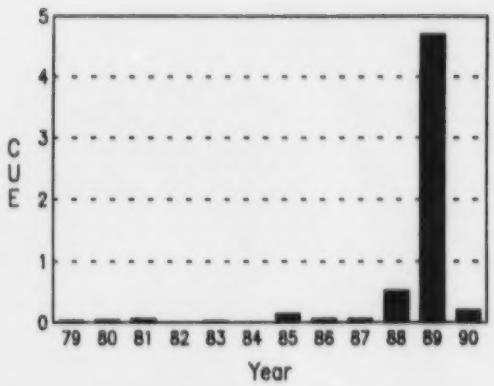

Figure 209. Lake trout/backcross annual gill net CUEs (kgs/km) for management area 6-3 (NC05).

ACKNOWLEDGEMENTS

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APPENDIX 1

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Table 1. Lake whitefish harvest, quota, effort and CUE for management area 4-1 (LH01).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	7272	N/A	N/A	203.8	34.8
1980	14184	N/A	N/A	607.4	23.3
1981	27823	N/A	N/A	620.6	44.8
1982	44208	N/A	N/A	339.9	111.9
1983	64974	N/A	N/A	485.1	113.8
1984	45918	65217	70.4	661.2	61.6
1985	39934	65217	61.2	694.6	57.5
1986	47259	65217	72.5	678.3	69.7
1987	59484	75172	79.1	664.1	92.8
1988	48566	71932	67.5	638.4	76.1
1989	31470	71932	43.7	485.3	64.8
1990	28356	71932	39.4	388.6	73.0

Table 2. Chub harvest, quota, effort, CUE and yield for management area 4-1 (LH01).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	2602	N/A	N/A	55.1	47.2	0.07
1980	3569	N/A	N/A	70.0	51.0	0.10
1981	2729	N/A	N/A	59.3	45.9	0.07
1982	318	N/A	N/A	0.0	0.0	0.01
1983	2722	N/A	N/A	35.4	49.0	0.06
1984	10106	15713	64.3	172.8	48.6	0.23
1985	15756	18070	87.2	232.2	67.9	0.42
1986	17115	18643	91.8	296.9	57.6	0.46
1987	13535	18685	72.4	204.5	65.0	0.36
1988	16883	20549	82.2	217.0	77.8	0.45
1989	20414	20549	99.3	263.8	77.4	0.55
1990	21814	22833	95.5	269.6	80.9	0.59

Table 3. Lake whitefish harvest, quota, effort and CUE for management areas 4-2 (LH02).

Year	Harvest (kgs)			Quota	Percent	Gill Effort	Impd Effort	Gill CUE	Impd CUE
	Gill	Impd	Total	(kgs)	Taken	(km)	(# of nets)	(kgs/km)	(kgs/net)
1979	60114	8318	68432	N/A	N/A	2167.9	112	27.7	74.3
1980	98789	10551	109340	N/A	N/A	2804.0	178	35.2	59.3
1981	110763	3663	114426	N/A	N/A	2088.4	44	53.0	83.2
1982	92296	21803	114099	N/A	N/A	1404.8	247	65.7	88.3
1983	75645	21047	96692	N/A	N/A	1003.7	231	75.4	91.1
1984	94753	21474	116227	132910	87.4	1521.4	219	62.3	98.1
1985	108579	20433	129012	132910	97.1	1162.8	251	93.4	81.4
1986	115121	21983	137104	132910	103.2	1426.0	249	80.7	88.3
1987	91570	25701	117271	153190	76.6	1123.8	233	81.5	110.3
1988	95881	48046	143927	153161	94.0	974.9	268	98.3	179.3
1989	70375	24064	94439	153161	61.7	937.5	228	75.1	105.5
1990	42698	18480	61178	153161	39.9	678.1	203	63.0	91.0

Note: Impd = Impoundment Nets

Table 4. Chub harvest, quota, effort, CUE and yield for management area 4-2 (LH02).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km) Harvest	Discards	Yield (kgs/ha)
1979	8647	N/A	N/A	277.9	29.0		0.12
1980	7530	N/A	N/A	287.0	26.1		0.10
1981	8217	N/A	N/A	210.1	36.6		0.11
1982	32785	N/A	N/A	345.0	83.8		0.43
1983	33180	N/A	N/A	437.0	66.1		0.45
1984	42418	35584	119.2	537.0	77.8		0.57
1985	35619	40922	87.0	507.8	60.6		0.48
1986	35433	35584	99.6	458.5	76.1	2.8	0.48
1987	31237	35665	87.6	466.6	59.2	1.1	0.38
1988	38988	39224	99.4	544.0	71.7	0.6	0.52
1989	39142	39224	99.8	431.1	90.8	1.5	0.53
1990	43129	43582	99.0	317.1	136.0	5.2	0.58

Table 5. Lake whitefish harvest, quota, effort and CUE for management area 4-3 (LH03).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	85184	N/A	N/A	1320.2	60.8
1980	47248	N/A	N/A	935.8	49.1
1981	35723	N/A	N/A	608.4	49.5
1982	74980	N/A	N/A	612.7	56.5
1983	45128	N/A	N/A	366.0	112.5
1984	36678	79520	46.1	355.3	102.3
1985	51611	79520	64.9	592.9	97.8
1986	38839	79518	48.8	439.4	88.8
1987	41467	114478	36.2	411.8	103.7
1988	69197	99768	69.4	805.1	85.9
1989	64713	98194	65.9	831.7	77.8
1990	69483	88263	78.7	953.0	71.4

Table 6. Chub harvest, quota, effort, CUE and yield for management area 4-3 (LH03).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km) Harvest	Discards	Yield (kgs/ha)
1979	3296	N/A	N/A	69.4	45.9		0.03
1980	9073	N/A	N/A	159.6	52.1		0.09
1981	8859	N/A	N/A	116.9	31.6		0.14
1982	6347	N/A	N/A	101.7	45.3		0.06
1983	3482	N/A	N/A	32.9	65.7		0.03
1984	30318	41640	72.8	274.8	109.4		0.30
1985	39184	41640	94.1	478.9	83.1		0.39
1986	34155	57603	59.3	536.8	64.0	3.8	0.34
1987	58471	59222	98.7	862.2	71.6	2.1	0.61
1988	47122	59371	79.4	662.5	71.1	3.4	0.46
1989	52317	59371	88.1	586.9	89.1	4.1	0.52
1990	45152	65751	68.7	429.0	105.2	14.6	0.44

Table 7. Lake whitefish harvest, quota, effort and CUE for management area 4-4 (LH05, LH06, LH07).

Year	Harvest (kgs)			Quota	Percent	Gill Effort (km)			CUE (kgs/km)	
	LH05	LH06	Total	(kgs)	Taken	LH05	LH06	Total	LH05	LH06
1979	80249	0	80249	N/A	N/A	714.0	0.0	714.0	112.0	0.0
1980	153897	68	153965	N/A	N/A	1290.7	0.0	1290.7	117.0	0.0
1981	103444	4304	107748	N/A	N/A	907.2	19.8	927.0	110.6	204.2
1982	157270	592	157862	N/A	N/A	1572.9	4.6	1577.5	98.3	67.4
1983	199122	588	199710	N/A	N/A	1427.2	8.4	1435.6	137.3	70.0
1984	256189	944	257133	273339	94.1	1349.7	13.0	1362.7	189.8	72.3
1985	312497	508	313005	273339	114.5	1053.5	0.9	1054.4	287.0	356.7
1986	241737	2	241739	284321	85.0	992.0	0.0	992.0	236.3	0.0
1987	343893	0	343893	327557	105.0	1456.4	0.0	1456.4	236.1	0.0
1988	261822	26758	288580	327495	88.1	1029.0	165.7	1194.7	254.4	161.5
1989	283154	36672	319826	327495	97.7	1210.0	145.7	1355.7	233.8	251.7
1990	332223	31589	363812	360244	101.0	1151.9	106.1	1258.0	288.4	297.7

Table 8. Chub harvest and quota for management area 4-4 (LH05, LH06, LH07).

Year	Harvest (kgs)				Quota	Percent
	LH05	LH06	LH07	Total	(kgs)	Taken
1979	4926	2823	0	7749	N/A	N/A
1980	7497	3337	0	10834	N/A	N/A
1981	59968	30739	7878	98585	N/A	N/A
1982	70351	48684	0	119035	N/A	N/A
1983	68080	58171	59708	185959	N/A	N/A
1984	73681	100951	64455	239087	275778	86.7
1985	23809	60298	58663	142770	317146	45.0
1986	39405	25966	56513	121884	277781	43.9
1987	66119	15011	2662	83792	276398	30.3
1988	90161	62350	51529	204040	234896	86.9
1989	94352	45127	0	139479	234896	59.4
1990	79294	55703	51229	186226	257211	72.4

Table 9. Chub effort, CUE and yield for management area 4-4 (LH05, LH06, LH07).

Year	Gill Effort (km)				Gill CUE (kgs/km)				Yield (kgs/ha)		
	LH05	LH06	LH07	Total	LH05 harvest	LH06 harvest	LH07 harvest	4-4 discards	LH05	LH06	LH07
1979	51.2	73.3	0.0	124.5	89.8	38.5	no data		0.05	0.04	0.00
1980	87.0	62.0	0.0	149.0	65.4	53.8	no data		0.07	0.05	0.00
1981	670.9	313.7	50.8	1035.4	79.4	98.0	155.1		0.58	0.45	0.06
1982	1018.5	757.0	0.0	1775.5	68.5	64.3	no data		0.68	0.72	0.00
1983	631.1	667.1	549.2	1847.4	93.1	87.2	108.7		0.66	0.86	0.44
1984	761.4	918.1	494.3	2173.8	86.2	109.8	130.4		0.71	1.49	0.48
1985	241.0	696.1	543.1	1480.2	98.8	86.6	108.0		0.23	0.89	0.43
1986	521.7	546.1	530.1	1597.9	75.5	47.5	106.6	1.5	0.38	0.38	0.42
1987	763.9	268.8	27.6	1060.3	86.5	55.8	96.4	4.7	0.64	0.22	0.02
1988	810.1	734.9	658.5	2203.5	111.3	84.8	78.3	22.1	0.87	0.92	0.38
1989	681.6	337.4	0.0	1019.0	138.4	133.7	no data	7.2	0.91	0.67	0.00
1990	480.5	308.2	150.0	938.6	165.0	180.8	341.6	17.8	0.77	0.82	0.38

Table 10. Yellow perch harvest, quota, effort and CUE for management area 4-4 (LH05, LH06, LH07).

Year	Harvest (kgs)			Quota	Percent	Gill Effort (km)			CUE (kgs/km)	
	LH05	LH06	Total	(kgs)	Taken	LH05	LH06	Total	LH05	LH06
1979	1688	995	2683	N/A	N/A	39.0	50.7	89.7	38.4	19.6
1980	9557	1245	10802	N/A	N/A	100.9	13.1	114.0	83.2	95.0
1981	3546	1324	4870	N/A	N/A	80.8	65.7	146.5	22.4	20.8
1982	5971	630	6601	N/A	N/A	138.1	32.7	170.8	39.2	19.3
1983	34380	7255	41635	N/A	N/A	469.7	112.9	582.6	57.9	65.3
1984	4868	3517	8385	10161	82.5	123.3	93.3	216.6	36.9	39.2
1985	5047	1723	6770	10161	66.6	81.1	15.9	97.0	55.1	108.4
1986	3749	4474	8223	10161	80.9	66.3	56.1	122.4	55.9	79.8
1987	13619	1302	14921	20362	73.3	170.5	32.1	202.6	74.6	40.6
1988	3372	2888	6260	20362	33.4	141.1	79.2	220.3	22.5	36.5
1989	6888	3854	10742	18327	58.6	219.2	39.6	258.8	27.8	97.3
1990	10567	1691	12258	18327	66.9	277.2	16.3	293.5	38.1	103.9

Table 11. Lake trout/backcross harvest and quota for management area 4-4 (LH05, LH06, LH07).

Year	Harvest (kgs)			Quota	Percent
	LH05	LH06	Total	(kgs)	Taken
1979	151	0	151	N/A	N/A
1980	330	1	331	N/A	N/A
1981	89	24	113	N/A	N/A
1982	192	205	397	N/A	N/A
1983	684	589	1273	N/A	N/A
1984	1287	22	1309	950	137.8
1985	262	106	368	950	38.7
1986	109	0	109	1583	6.9
1987	107	0	107	1593	6.7
1988	191	0	191	1593	12.0
1989	899	2	901	1582	57.0
1990	1592	12	1625	1582	102.7

Table 12. Lake whitefish harvest, quota, effort and CUE for management area 4-5 (LH08, LH09).

Year	Harvest (kgs)			Quota	Percent	Gill Effort	Trap Effort	Gill CUE	Trap CUE
	Gill	Trap	Total	(kgs)	Taken	(km)	(# of nets)	(kgs/km)	(kgs/net)
1979	215118	19364	234482	N/A	N/A	2797.2	759	76.9	25.5
1980	205078	32217	237295	N/A	N/A	2727.4	1086	75.2	29.7
1981	239470	34446	273916	N/A	N/A	2243.3	1275	106.7	27.0
1982	341880	46566	388446	N/A	N/A	2717.9	1248	125.8	37.3
1983	701812	90874	792686	N/A	N/A	4808.3	985	146.0	92.3
1984	473853	40795	514648	575068	89.4	4260.5	454	111.2	89.9
1985	537770	60800	598570	575068	104.1	2655.3	464	202.5	131.0
1986	514792	56593	571385	567358	100.7	2454.3	800	209.7	70.7
1987	531662	33265	564427	567806	99.4	2774.4	1010	191.6	32.9
1988	538241	24352	562593	567722	99.1	3060.7	626	175.9	38.9
1989	516942	36427	553369	578683	95.6	2310.5	873	223.7	41.7
1990	586046	18749	604795	625697	96.7	2055.3	148	285.1	126.7

Table 13. Chub harvest, quota, effort, CUE and yield for management area 4-5 (LH08, LH09).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)		Yield (kgs/ha)
					Harvest	Discards	
1979	49165	N/A	N/A	571.9	86.0		0.29
1980	77729	N/A	N/A	568.2	136.8		0.46
1981	98467	N/A	N/A	1150.0	85.6		0.58
1982	63887	N/A	N/A	1099.5	58.1		0.37
1983	54482	N/A	N/A	721.2	75.5		0.32
1984	161434	174608	92.5	2062.4	78.3		0.95
1985	161753	200799	80.6	3833.0	42.2		0.95
1986	97368	174637	55.8	1015.3	95.9	12.0	0.57
1987	47686	174855	27.3	830.9	57.4	6.2	0.28
1988	96898	158856	61.0	1385.5	69.9	4.6	0.57
1989	18709	169291	11.1	168.9	110.8	48.0	0.11
1990	31721	151161	21.0	188.6	168.2	93.4	0.19

Table 14. Yellow perch harvest, quota, effort and CUE for management area 4-5 (LH08, LH09).

Year	Harvest (kgs)			Quota	Percent	Gill Effort	Trap Effort	Gill CUE	Trap CUE
	Gill	Trap	Total	(kgs)	Taken	(km)	(# of nets)	(kgs/km)	(kgs/net)
1979	49297	7415	56712	N/A	N/A	1557.0	2546	31.7	2.9
1980	183939	8301	192240	N/A	N/A	2289.5	2762	80.3	3.0
1981	225848	13897	239745	N/A	N/A	4598.2	2727	49.1	5.1
1982	127744	5636	133380	N/A	N/A	4833.2	2361	26.4	2.4
1983	99115	10789	109904	N/A	N/A	2880.9	2729	34.4	4.0
1984	198785	7566	206351	249353	82.8	3832.0	2139	51.9	3.5
1985	214888	13264	228152	249353	91.5	4976.8	2162	43.2	6.1
1986	233977	10529	244506	249353	98.1	3850.8	1785	60.8	5.9
1987	189704	11127	200831	313275	64.1	3239.8	2388	58.6	4.7
1988	154136	3814	157950	272522	58.0	2930.9	1505	52.6	2.5
1989	231414	8148	239562	279834	85.6	3509.1	1827	65.9	4.5
1990	180063	4239	184302	264894	69.6	3026.0	2294	59.5	1.8

Table 15. Walleye harvest, quota, effort and CUE for management area 4-5 (LH08, LH09).

Year	Harvest (kgs)			Quota	Percent	Gill Effort	Trap Effort	Gill CUE	Trap CUE
	Gill	Trap	Total	(kgs)	Taken	(km)	(# of nets)	(kgs/km)	(kgs/net)
1979	10537	84262	94799	N/A	N/A	818.2	2583	12.9	32.6
1980	20712	104302	125014	N/A	N/A	932.4	2798	22.2	37.3
1981	21741	100645	122386	N/A	N/A	1176.5	2898	18.5	34.7
1982	26418	87995	114413	N/A	N/A	1502.0	2253	17.6	39.1
1983	27095	93930	121025	N/A	N/A	1195.9	2905	22.7	32.3
1984	21757	107277	129034	125355	102.9	1170.8	3300	18.6	32.5
1985	17154	102446	119600	125355	95.4	512.1	2163	33.5	47.4
1986	10320	112503	122823	125355	98.0	782.6	2330	13.2	48.3
1987	13607	123201	136808	137414	99.6	901.6	2453	15.1	50.2
1988	12707	126152	138859	137891	100.7	806.1	1794	15.8	70.3
1989	8625	102383	111008	137910	80.5	566.6	2032	15.2	50.4
1990	9447	119968	129415	138504	93.4	42.0	2017	224.9	59.5

Table 16. Lake trout/backcross harvest and quota for management area 4-5 (LH08, LH09).

Year	Harvest (kgs)			Quota	Percent
	Gill	Trap	Total	(kgs)	Taken
1979	20086	6614	26700	N/A	N/A
1980	23412	5978	29390	N/A	N/A
1981	22675	4563	27238	N/A	N/A
1982	14837	3598	18435	N/A	N/A
1983	49371	5127	54498	N/A	N/A
1984	21431	5686	27117	37234	72.8
1985	19023	1212	20235	37209	54.4
1986	28718	1006	29724	37211	79.9
1987	26766	3063	29829	37240	80.1
1988	16701	1255	17956	37240	48.2
1989	14012	1122	15134	34062	44.4
1990	10523	1462	11985	36908	32.5

Table 17. Lake whitefish harvest, quota, effort and CUE for management area 4-7(LH04).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	11177	N/A	N/A	447.8	22.1
1980	27074	N/A	N/A	346.0	75.0
1981	35103	N/A	N/A	381.6	87.9
1982	19962	N/A	N/A	243.5	80.6
1983	34788	N/A	N/A	410.6	78.4
1984	20243	76401	26.5	240.7	85.4
1985	48705	76401	63.7	259.1	156.1
1986	49133	76401	64.3	274.0	175.4
1987	76638	74038	103.5	727.9	105.3
1988	36614	68816	53.2	219.0	167.2
1989	59893	67909	88.2	312.4	191.7
1990	71889	73518	97.8	312.0	230.4

Table 18. Chub harvest, quota, effort, CUE and yield for management area 4-7 (LH04).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)		Yield (kgs/ha)
					Harvest	Discards	
1979	4918	N/A	N/A	108.5	41.3		0.03
1980	8249	N/A	N/A	322.9	25.2		0.06
1981	16486	N/A	N/A	310.6	50.9		0.12
1982	7543	N/A	N/A	152.5	49.4		0.06
1983	5457	N/A	N/A	116.8	45.4		0.04
1984	42954	38946	110.3	556.2	78.3		0.32
1985	33275	44788	74.3	435.4	67.5		0.24
1986	32145	54092	59.4	394.1	81.6	9.2	0.24
1987	39352	53967	72.9	591.0	66.5	5.8	0.29
1988	41537	53764	77.3	480.9	86.4	6.4	0.30
1989	49596	53764	92.2	512.5	96.8	10.7	0.36
1990	23691	55463	42.7	269.6	87.9	no data	0.17

Table 19. Lake whitefish harvest, quota, effort and CUE for management area 5-1 (GB01).

Year	Harvest (kgs)	Quota (Kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	13362	N/A	N/A	545.5	24.3
1980	24536	N/A	N/A	417.6	28.6
1981	15061	N/A	N/A	173.3	28.7
1982	7679	N/A	N/A	183.5	11.4
1983	6517	N/A	N/A	462.5	9.9
1984	9593	49037	19.6	193.7	44.8
1985	17974	49037	36.7	363.0	49.7
1986	28899	49037	58.9	448.2	63.8
1987	11944	41836	28.5	393.8	29.8
1988	8717	42114	20.7	594.0	14.4
1989	7370	35509	20.8	121.9	60.5
1990	7461	33722	22.1	105.1	71.0

Table 20. Chub harvest, quota, effort, CUE and yield for management area 5-1 (GB01).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	7096	N/A	N/A	211.6	33.8	4.09
1980	914	N/A	N/A	108.3	8.4	0.53
1981	980	N/A	N/A	33.0	29.9	0.56
1982	3555	N/A	N/A	121.6	28.3	2.05
1983	1464	N/A	N/A	60.9	21.1	0.83
1984	4529	18004	25.2	139.8	31.6	2.76
1985	4697	20704	22.7	48.1	98.3	2.71
1986	12490	17553	71.2	285.8	44.0	7.20
1987	9290	17468	53.2	243.2	37.7	5.32
1988	6166	17599	35.0	226.1	27.3	3.53
1989	3799	17052	22.3	14.8	256.7	2.18
1990	752	17052	4.4	7.3	102.8	0.43

Table 21. Yellow perch harvest, quota, effort and CUE for management area 5-1 (GB01).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	15888	N/A	N/A	792.8	20.0
1980	15970	N/A	N/A	510.4	24.1
1981	14809	N/A	N/A	503.4	23.7
1982	6727	N/A	N/A	335.5	18.2
1983	16126	N/A	N/A	774.2	20.5
1984	14714	28783	51.1	557.0	28.4
1985	11601	28783	40.3	227.9	50.3
1986	8510	30824	27.6	358.7	23.4
1987	6789	29788	22.8	330.6	20.4
1988	6994	29869	23.4	571.7	12.2
1989	1907	25801	7.4	104.4	18.3
1990	1305	24983	5.2	36.1	36.1

Table 22. Lake trout/backcross harvest and quota for management area 5-1 (GB01).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	412	N/A	N/A
1980	3546	N/A	N/A
1981	850	N/A	N/A
1982	900	N/A	N/A
1983	271	N/A	N/A
1984	822	1588	51.8
1985	2286	1588	144.0
1986	2591	2672	97.0
1987	1187	2562	46.3
1988	1387	2562	54.1
1989	845	2596	32.6
1990	1180	2482	47.5

Table 23. Lake whitefish harvest, quota, effort and CUE for management area 5-2 (GB02).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	17267	N/A	N/A	764.3	22.5
1980	8428	N/A	N/A	620.0	13.5
1981	7343	N/A	N/A	280.5	25.6
1982	6732	N/A	N/A	92.7	71.4
1983	6360	N/A	N/A	157.7	40.2
1984	9488	22612	42.0	154.4	61.4
1985	7239	22612	32.0	201.8	34.7
1986	2532	21354	11.9	69.5	37.5
1987	2507	21398	11.7	74.7	31.4
1988	2108	21398	9.9	21.9	94.0
1989	1683	19258	8.7	33.2	51.3
1990	2553	18901	13.5	31.0	82.2

Table 24. Chub harvest, quota, effort, CUE and yield for management area 5-2 (GB02).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	10228	N/A	N/A	313.8	31.5	0.87
1980	3502	N/A	N/A	56.6	29.2	0.30
1981	14	N/A	N/A	3.7	3.8	0.00
1982	1	N/A	N/A	2.7	0.0	0.00
1983	0	N/A	N/A	0.0	0.0	0.00
1984	8583	17270	49.7	59.5	141.9	0.73
1985	11838	20120	58.8	90.8	101.8	1.01
1986	10754	17270	62.3	159.9	67.5	0.92
1987	8139	19841	41.0	123.7	65.8	0.69
1988	7260	20163	36.0	124.4	58.4	0.62
1989	109	20163	0.5	2.7	40.4	0.01
1990	92	20001	0.5	1.5	62.9	0.01

Table 25. Yellow perch harvest, quota, effort and CUE for management area 5-2 (GB02).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	287	N/A	N/A	4.7	47.0
1980	0	N/A	N/A	0.0	0.0
1981	0	N/A	N/A	0.0	0.0
1982	22	N/A	N/A	2.7	8.1
1983	212	N/A	N/A	0.0	0.0
1984	179	907	19.7	12.3	14.5
1985	477	1043	45.7	14.2	31.1
1986	112	1043	10.7	15.0	5.1
1987	845	1132	74.6	38.9	20.3
1988	484	1244	38.9	7.1	68.2
1989	1	1244	0.1	0.0	0.0
1990	10	1244	0.8	0.5	18.2

Table 26. Walleye harvest, quota and CUE for management area 5-2 (GB02).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	CUE (kgs/km)
1979	7253	N/A	N/A	17.9
1980	7727	N/A	N/A	19.7
1981	5942	N/A	N/A	24.8
1982	5837	N/A	N/A	43.6
1983	6671	N/A	N/A	28.1
1984	3443	5002	68.8	24.8
1985	1878	5002	37.5	17.8
1986	1981	4551	43.5	25.4
1987	2014	4561	44.2	21.8
1988	2144	4591	46.7	50.9
1989	1940	4591	42.3	21.3
1990	1133	4568	24.8	46.6

Table 27. Lake whitefish harvest, quota, effort and CUE for management area 5-3 (GB03, GB04, GB06).

Year	Harvest (kgs)				Quota	Percent	Gill Effort (km)			CUE (kgs/km)	
	GB03	GB04	GB06	Total	(kgs)	Taken	GB03	GB06	Total	GB03	GB06
1979	5903	0	0	5903	N/A	N/A	47.1	0.0	47.1	55.3	0.0
1980	6938	0	4264	11202	N/A	N/A	65.7	40.6	106.3	77.7	105.0
1981	5307	0	765	6072	N/A	N/A	71.9	50.1	122.0	64.4	15.3
1982	6627	109	1952	8688	N/A	N/A	70.6	124.7	195.3	92.1	14.9
1983	2679	0	263	2942	N/A	N/A	41.8	10.2	52.0	64.1	25.8
1984	9026	0	324	9350	30120	31.0	71.6	8.9	80.5	121.8	36.4
1985	29541	10	2815	32366	30120	107.5	380.1	44.0	424.1	77.7	64.0
1986	23729	0	2700	26429	31881	82.9	253.1	67.7	320.8	86.8	39.5
1987	15916	107	1192	17215	39946	43.1	202.6	32.1	234.7	78.6	37.1
1988	5800	1	2368	8169	40197	20.3	179.9	18.1	198.0	32.2	130.8
1989	6872	0	2125	8997	36508	24.6	38.5	19.5	58.0	178.5	109.0
1990	10981	45	2127	13153	35440	37.1	69.9	17.3	87.2	157.2	123.1

Table 28. Chub harvest and quota for management area 5-3 (GB03, GB04, GB05).

Year	Harvest (kgs)				Quota	Percent
	GB03	GB04	GB06	Total	(kgs)	Taken
1979	37874	23955	10321	72150	N/A	N/A
1980	25546	19159	11475	56180	N/A	N/A
1981	18811	18427	10979	48217	N/A	N/A
1982	22284	5604	17227	45115	N/A	N/A
1983	36101	17283	45477	98861	N/A	N/A
1984	50760	19340	60016	130116	182268	71.4
1985	68764	11704	84901	165369	182268	90.7
1986	47239	18150	64399	129788	182268	71.2
1987	36063	20662	45287	102012	185787	54.9
1988	53956	31826	67785	153567	185787	82.7
1989	66617	9665	73453	149735	185787	80.6
1990	56829	5755	60718	123302	198722	62.0

Table 29. Chub effort, CUE and yield for management area 5-3 (GB03, GB04, GB06).

Year	Gill Effort (km)				Gill CUE (kgs/km)				Yield (kgs/ha)		
	GB03	GB04	GB06	Total	GB03		GB04	GB06	GB03	GB04	GB06
					Harvest	Discards					
1979	717.4	397.4	305.1	1419.9	52.8		60.3	33.8	0.39	0.29	0.09
1980	1008.6	463.4	356.3	1828.3	25.3		41.3	32.2	0.27	0.23	0.10
1981	513.1	411.8	352.3	1277.2	36.7		44.7	31.2	0.20	0.23	0.09
1982	492.2	170.7	636.6	1299.5	45.3		32.8	27.1	0.23	0.07	0.15
1983	691.6	426.1	1356.8	2474.5	52.2		40.6	33.5	0.38	0.21	0.39
1984	608.1	173.0	589.5	1370.6	83.4		111.8	101.8	0.53	0.24	0.52
1985	802.4	83.4	797.4	1683.2	85.7		140.3	106.5	0.71	0.14	0.73
1986	740.7	185.2	765.2	1691.1	63.8	12.2	98.0	84.2	0.49	0.22	0.55
1987	542.0	172.6	691.3	1405.9	66.5	8.8	119.7	65.5	0.37	0.25	0.39
1988	783.7	331.8	1093.4	2208.9	68.8	5.3	95.9	62.0	0.56	0.39	0.58
1989	665.8	109.8	997.8	1773.4	100.1	9.2	88.0	73.6	0.69	0.12	0.63
1990	707.5	54.9	791.4	1553.8	80.3	53.8	104.9	76.7	0.59	0.07	0.52

Table 30. Yellow perch harvest and quota for management area 5-3 (GB03, GB04, GB06).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	1071	N/A	N/A
1980	489	N/A	N/A
1981	128	N/A	N/A
1982	337	N/A	N/A
1983	207	N/A	N/A
1984	433	4100	10.6
1985	193	4100	4.7
1986	52	4100	1.3
1987	1000	3899	25.6
1988	88	3899	2.3
1989	71	4554	1.6
1990	112	4423	2.5

Table 31. Lake trout/backcross harvest, quota and CUE for management area 5-3 (GB03, GB04, GB06).

Year	Harvest (kgs)				Quota	Percent	CUE (kgs/km)	
	GB03	GB04	GB06	Total	(kgs)	Taken	GB03	GB06
1979	13	0	0	13	N/A	N/A	2.4	0.0
1980	298	0	2792	3090	N/A	N/A	3.3	70.7
1981	82	0	1600	1682	N/A	N/A	1.6	30.0
1982	0	0	0	0	N/A	N/A	0.0	0.0
1983	6	0	0	6	N/A	N/A	0.9	0.0
1984	0	0	0	0	4377	0.0	0.0	0.0
1985	252	0	1566	1818	4377	41.5	18.7	39.7
1986	1545	0	1520	3065	5044	60.8	15.3	24.9
1987	1332	0	1194	2526	2786	90.7	13.6	27.8
1988	525	0	1015	1540	2786	55.3	11.9	55.8
1989	42	0	568	610	2820	21.6	10.5	51.2
1990	137	0	292	429	2706	15.9	3.9	22.2

Table 32. Lake whitefish harvest, quota, effort and CUE for management area 5-4 (GB05).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	2781	N/A	N/A	48.2	57.4
1980	2305	N/A	N/A	92.7	23.3
1981	2718	N/A	N/A	75.7	33.9
1982	4090	N/A	N/A	83.8	45.1
1983	1293	N/A	N/A	58.6	20.6
1984	291	5733	5.1	4.5	59.3
1985	587	5733	10.2	3.8	155.3
1986	714	5958	12.0	16.4	43.7
1987	3415	7225	47.3	50.3	67.9
1988	1303	7273	17.9	30.2	42.0
1989	2997	7220	41.5	36.5	82.1
1990	2019	6823	29.6	21.0	96.2

Table 33. Chub harvest, quota, effort, CUE and yield for management area 5-4 (GB05).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	25615	N/A	N/A	621.5	41.5	0.63
1980	16301	N/A	N/A	405.6	40.2	0.40
1981	0	N/A	N/A	0.0	0.0	0.00
1982	444	N/A	N/A	9.3	41.3	0.01
1983	900	N/A	N/A	71.7	12.6	0.02
1984	4746	13518	35.1	24.0	199.0	0.12
1985	5835	15546	37.5	47.6	85.6	0.14
1986	2901	13518	21.5	47.7	61.2	0.07
1987	5252	17884	29.4	68.3	76.9	0.13
1988	9368	18000	52.0	169.2	55.4	0.23
1989	779	18000	4.3	5.6	139.1	0.02
1990	169	25200	0.7	3.6	47.4	0.01

Table 34. Yellow perch harvest, quota, effort and CUE for management area 5-4 (GB05).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	6186	N/A	N/A	122.2	49.7
1980	6126	N/A	N/A	102.2	58.7
1981	8522	N/A	N/A	140.6	60.6
1982	8528	N/A	N/A	256.3	33.1
1983	4979	N/A	N/A	188.5	26.0
1984	4883	4767	102.4	66.1	73.9
1985	504	4767	10.6	11.9	42.4
1986	1476	4790	30.8	35.0	42.2
1987	2317	5230	44.3	46.9	49.4
1988	2268	5706	39.7	35.5	63.9
1989	682	5706	12.0	15.0	45.5
1990	1277	5706	22.4	17.8	71.6

Table 35. Lake whitefish harvest, quota, effort and CUE for management area 5-5 (GB07).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	2590	N/A	N/A	54.4	45.3
1980	1123	N/A	N/A	36.6	28.5
1981	1283	N/A	N/A	23.8	53.7
1982	3225	N/A	N/A	75.7	41.6
1983	5490	N/A	N/A	94.9	53.8
1984	4323	6759	64.0	39.3	109.4
1985	6162	6759	91.2	60.3	98.2
1986	9613	8111	118.5	95.6	101.0
1987	7595	10731	70.8	106.4	71.1
1988	3961	12620	31.4	55.7	70.5
1989	3900	11766	33.1	51.2	36.7
1990	5103	11353	44.9	54.1	94.3

Table 36. Chub harvest, quota, effort, CUE and yield for management area 5-5 (GB07).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	8867	N/A	N/A	161.2	55.0	0.09
1980	4560	N/A	N/A	106.9	41.8	0.05
1981	1087	N/A	N/A	16.3	62.4	0.01
1982	2087	N/A	N/A	26.7	78.7	0.02
1983	14942	N/A	N/A	141.5	91.7	0.14
1984	13504	11265	119.9	134.2	101.4	0.14
1985	15063	12955	116.3	171.6	88.4	0.16
1986	10787	18925	57.0	152.2	66.5	0.11
1987	18396	31280	58.8	394.5	46.6	0.19
1988	25945	31488	82.4	399.7	64.9	0.27
1989	23767	31488	75.5	251.7	94.4	0.25
1990	5980	34364	17.4	89.9	66.5	0.06

Table 37. Yellow perch harvest, quota, effort and CUE for management area 5-5 (GB07).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	11938	N/A	N/A	116.7	102.3
1980	9741	N/A	N/A	122.0	77.7
1981	8117	N/A	N/A	110.7	73.1
1982	4957	N/A	N/A	111.9	43.2
1983	8108	N/A	N/A	297.6	27.2
1984	8263	6804	121.4	127.5	64.8
1985	3991	6804	58.7	94.7	42.1
1986	4868	11794	41.3	94.0	51.8
1987	7332	12500	58.7	141.1	52.0
1988	12035	13182	91.3	180.0	66.9
1989	4840	13182	36.7	89.8	53.9
1990	4078	13128	31.1	56.1	72.6

Table 38. Lake whitefish harvest and quota for management area 5-6 (GB08).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	0	N/A	N/A
1980	205	N/A	N/A
1981	415	N/A	N/A
1982	5836	N/A	N/A
1983	8450	N/A	N/A
1984	73	7480	1.0
1985	4283	7480	57.3
1986	8137	12211	66.6
1987	9060	16246	55.8
1988	3691	16354	22.6
1989	6572	16354	40.2
1990	1981	16308	12.1

Table 39. Chub harvest, quota, effort, CUE and yield for management area 5-6 (GB08).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km) Harvest	Discards	Yield (kgs/ha)
1979	4708	N/A	N/A	155.2	28.1		0.03
1980	3554	N/A	N/A	101.5	28.2		0.02
1981	3662	N/A	N/A	69.0	44.3		0.02
1982	10591	N/A	N/A	211.5	44.5		0.07
1983	13582	N/A	N/A	159.4	54.6		0.08
1984	27978	28748	97.3	303.7	91.2		0.19
1985	34135	42077	81.1	325.5	103.4		0.24
1986	29373	49822	59.0	342.5	84.0	2.7	0.20
1987	27263	54941	49.6	344.8	79.1	3.6	0.19
1988	40844	55307	73.8	477.3	85.6	no data	0.28
1989	41194	55307	74.5	376.2	109.5	7.5	0.28
1990	43668	60820	71.8	352.1	124.0	6.9	0.30

Table 40. Lake trout/backcross harvest and quota for management area 5-6 (GB08).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	0	N/A	N/A
1980	0	N/A	N/A
1981	0	N/A	N/A
1982	0	N/A	N/A
1983	0	N/A	N/A
1984	0	2268	0.0
1985	7270	2268	320.5
1986	1717	2279	75.3
1987	3508	4558	77.0
1988	11923	4558	261.6
1989	4820	4558	105.7
1990	3373	4558	74.0

Table 41. Lake whitefish harvest, quota, effort and CUE for management area 5-7 (GB09).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	17043	N/A	N/A	99.4	169.6
1980	20873	N/A	N/A	370.5	54.4
1981	9490	N/A	N/A	125.8	75.2
1982	12241	N/A	N/A	433.8	25.5
1983	3039	N/A	N/A	130.4	22.0
1984	5649	13878	40.7	115.8	48.9
1985	8337	13878	60.1	181.3	46.3
1986	16783	20998	79.9	182.6	92.5
1987	9275	21021	44.1	142.8	64.9
1988	4431	24248	18.3	102.2	42.9
1989	6572	24338	27.0	100.7	65.2
1990	6446	14346	44.9	90.0	71.6

Table 42. Chub harvest, quota, effort, CUE and yield for management area 5-7 (GB09).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	7452	N/A	N/A	194.2	38.6	0.16
1980	2742	N/A	N/A	55.5	39.5	0.06
1981	0	N/A	N/A	0.0	0.0	0.00
1982	0	N/A	N/A	0.0	0.0	0.00
1983	5204	N/A	N/A	44.5	70.2	0.10
1984	6668	8111	82.2	78.2	85.8	0.15
1985	9072	11918	76.1	102.4	89.2	0.20
1986	4411	10364	42.6	60.5	68.5	0.10
1987	8253	10471	78.8	137.4	60.1	0.18
1988	10492	11441	91.7	108.6	96.6	0.23
1989	9870	10538	93.7	76.1	129.7	0.22
1990	11167	11592	96.3	97.4	114.7	0.24

Table 43. Yellow perch harvest and quota for management area 5-7 (GB09).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	4330	N/A	N/A	37.2	115.3
1980	1857	N/A	N/A	6.4	162.2
1981	371	N/A	N/A	3.1	119.0
1982	3613	N/A	N/A	5.2	186.5
1983	9454	N/A	N/A	154.2	61.0
1984	597	4672	12.8	5.6	75.4
1985	2081	4672	44.5	21.6	81.2
1986	7258	7031	103.2	97.4	72.6
1987	5504	10542	52.2	104.0	51.7
1988	6147	11211	54.8	97.1	56.6
1989	1693	11226	15.1	23.0	44.0
1990	4194	8729	48.0	65.7	63.9

Table 44. Lake whitefish harvest, quota, effort and CUE for management area 5-8 (GB10).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	1368	N/A	N/A	31.6	34.4
1980	10539	N/A	N/A	553.9	18.4
1981	7256	N/A	N/A	311.8	21.8
1982	11726	N/A	N/A	310.6	36.9
1983	12070	N/A	N/A	310.2	34.9
1984	898	13518	6.6	20.6	37.1
1985	3926	3605	108.9	27.2	137.9
1986	4560	3605	126.5	20.9	210.0
1987	3344	9012	37.1	30.2	108.9
1988	3468	9072	38.2	37.7	91.2
1989	4114	9072	45.3	27.1	151.7
1990	8239	9072	90.8	39.5	208.4

Table 45. Chub harvest, quota, effort, CUE and yield for management area 5-8 (GB10).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	17230	N/A	N/A	480.8	31.4	0.22
1980	4159	N/A	N/A	102.5	29.8	0.05
1981	2371	N/A	N/A	56.5	34.3	0.03
1982	7651	N/A	N/A	67.4	51.7	0.10
1983	25413	N/A	N/A	174.0	90.4	0.33
1984	22639	13518	167.5	289.4	74.0	0.32
1985	22546	25339	89.0	281.9	80.5	0.33
1986	16711	23071	72.4	246.9	68.1	0.25
1987	13786	16447	83.8	268.7	50.5	0.20
1988	16339	16533	98.8	172.8	94.5	0.24
1989	22366	16533	135.3	159.6	140.1	0.33
1990	16968	18186	93.3	157.1	108.0	0.25

Table 46. Lake trout/backcross harvest, quota, effort and CUE for management area 5-8 (GB10).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	745	N/A	N/A	26.6	11.7
1980	30074	N/A	N/A	565.7	52.7
1981	23474	N/A	N/A	343.5	68.1
1982	21238	N/A	N/A	0.0	0.0
1983	17798	N/A	N/A	1.1	108.2
1984	2225	2268	98.1	0.0	0.0
1985	4220	4536	93.0	30.3	130.9
1986	3945	4536	87.0	20.9	164.2
1987	4374	4536	96.4	30.2	143.8
1988	4032	4536	88.9	37.7	102.3
1989	4584	4536	101.1	27.1	169.1
1990	4470	4536	98.5	36.3	123.3

Table 47. Lake whitefish harvest, quota, effort and CUE for management area 5-9 (GB11).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	10438	N/A	N/A	245.7	42.7
1980	20318	N/A	N/A	665.2	30.6
1981	46181	N/A	N/A	585.8	79.1
1982	25554	N/A	N/A	644.4	36.6
1983	28233	N/A	N/A	634.4	38.9
1984	26863	26811	100.2	239.6	112.8
1985	33472	33565	99.7	128.8	261.5
1986	33112	40361	82.0	152.4	218.6
1987	19239	40441	47.6	151.4	127.1
1988	19457	40710	47.8	148.3	131.2
1989	18663	38460	48.5	136.6	136.6
1990	19937	40710	49.0	118.4	168.4

Table 48. Chub harvest, quota, effort, CUE and yield for management area 5-9 (GB11).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)	Yield (kgs/ha)
1979	666	N/A	N/A	36.6	18.0	0.02
1980	115	N/A	N/A	9.7	11.9	0.00
1981	23	N/A	N/A	1.8	12.2	0.00
1982	0	N/A	N/A	0.0	0.0	0.00
1983	7001	N/A	N/A	82.5	29.1	0.16
1984	3135	3154	99.4	51.7	61.0	0.09
1985	2839	3627	78.3	38.4	74.4	0.08
1986	5596	6849	81.7	84.7	66.5	0.16
1987	2419	6736	35.9	58.4	41.2	0.07
1988	7058	6780	104.1	92.8	75.9	0.20
1989	11171	11303	98.8	85.1	131.2	0.31
1990	9991	9958	100.3	68.6	145.6	0.28

Table 49. Lake trout/backcross harvest, quota, effort and CUE for management area 5-9 (GB11).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	0	N/A	N/A	70.0	1.7
1980	175	N/A	N/A	422.4	11.9
1981	0	N/A	N/A	331.2	39.2
1982	19	N/A	N/A	0.7	27.1
1983	0	N/A	N/A	0.0	0.0
1984	4	4037	0.1	3.2	1.3
1985	4000	4037	99.1	117.8	33.6
1986	4627	4930	93.9	130.2	35.5
1987	3090	4937	62.6	128.5	23.9
1988	4909	4937	99.4	124.1	39.5
1989	4574	4937	92.6	105.4	43.4
1990	4818	4937	97.6	79.6	60.6

Table 50. Lake whitefish harvest and quota for management area 6-1 (NC01, NC02, NC03).

Year	Gill Net Harvest (kgs)				Trap Net Harvest (kgs)			Harvest	Quota	Percent
	NC01	NC02	NC03	Total	NC01	NC02	Total	Total	(kgs)	Taken
1979	7606	55051	3012	65669	0	0	0	65669	N/A	N/A
1980	2735	70622	2268	75625	0	355	355	75980	N/A	N/A
1981	7613	84974	8137	100724	0	495	495	101219	N/A	N/A
1982	14988	152327	7914	175229	0	520	520	175749	N/A	N/A
1983	26070	175116	11317	212503	0	0	0	212503	N/A	N/A
1984	35782	123298	20585	179665	0	100	100	179765	238549	75.4
1985	22957	129839	19020	171816	0	1797	1797	173613	266770	65.1
1986	24280	137953	10634	172867	2258	501	2759	175626	240414	73.1
1987	8924	146310	18104	173338	8113	21489	29602	202940	241643	84.0
1988	17297	124432	9414	151143	5002	23427	28429	179572	241643	74.3
1989	52116	69799	6096	128011	1952	8387	10339	138350	243007	56.9
1990	37589	73938	13682	125209	1134	6551	7685	132894	217463	61.1

Table 51. Lake whitefish effort and CUE for management area 6-1 (NC01, NC02, NC03).

Year	Gill Net Effort (km)				Trap Effort (# nets)			Gill CUE (kgs/km)			Trap CUE kg/net	
	NC01	NC02	NC03	Total	NC01	NC02	Total	NC01	NC02	NC03	NC01	NC02
1979	318.6	1764.7	146.9	2230.2	0	0	0	23.9	31.2	20.5	0.0	0.0
1980	105.5	1801.5	121.6	2028.6	0	7	0	25.9	39.2	18.7	0.0	50.7
1981	178.5	1610.5	343.1	2132.1	0	13	0	42.6	52.8	23.7	0.0	38.1
1982	302.4	2199.5	215.0	2716.9	0	9	9	49.6	69.3	36.8	0.0	57.8
1983	344.6	2544.6	284.5	3173.7	0	0	0	75.7	68.8	39.8	0.0	0.0
1984	347.7	2173.7	413.3	2934.7	0	2	2	102.9	56.7	49.8	0.0	50.0
1985	336.0	2522.9	367.7	3226.6	0	24	24	68.3	51.5	51.7	0.0	74.9
1986	463.3	2699.0	291.5	3453.8	17	4	21	52.4	51.1	36.5	132.8	125.3
1987	230.8	2328.3	338.7	2897.8	58	138	196	38.7	62.8	53.5	139.9	155.7
1988	414.9	2218.7	213.2	2846.8	61	198	259	41.7	56.0	44.2	82.0	118.3
1989	1139.1	1691.4	217.7	3048.2	23	103	126	45.8	41.3	28.0	84.9	81.4
1990	909.9	1689.4	413.5	3012.8	27	146	173	41.3	43.8	33.1	42.0	44.9

Table 52. Yellow perch harvest, quota, effort and CUE for management area 6-1 (NC01, NC02, NC03).

Year	Harvest (kgs)				Quota	%	Gill Net Effort (km)				Gill CUE (kgs/km)		
	NC01	NC02	NC03	Total	(kgs)	Taken	NC01	NC02	NC03	Total	NC01	NC02	NC03
1979	617	4858	11890	17365	N/A	N/A	19.3	97.3	187.9	304.5	32.0	49.9	63.3
1980	29	842	2818	3689	N/A	N/A	1.6	8.6	32.0	42.2	18.1	97.9	88.1
1981	77	7396	33224	40697	N/A	N/A	1.3	135.9	458.8	596.0	59.2	54.4	72.4
1982	3	5223	18638	23864	N/A	N/A	3.7	66.9	486.1	556.7	0.8	78.1	38.3
1983	0	11003	9911	20914	N/A	N/A	0.0	215.3	272.9	488.2	0.0	51.1	36.3
1984	67	9221	25843	35131	67474	52.1	1.3	179.8	538.8	719.9	51.5	51.3	48.0
1985	0	6993	22791	29784	67474	44.1	0.0	150.5	492.9	643.4	0.0	46.5	46.2
1986	118	3532	12490	16140	68425	23.6	1.0	142.5	521.3	664.8	118.0	24.8	24.0
1987	0	4292	18656	22948	68458	33.5	0.0	100.2	487.9	588.1	0.0	42.8	38.2
1988	417	8247	31942	40606	75073	54.1	7.4	187.0	594.0	788.4	56.4	44.1	53.8
1989	1195	4944	23884	30023	78779	38.1	20.9	187.8	535.0	743.7	57.2	26.3	44.6
1990	863	7814	26296	34973	70314	49.7	11.1	218.9	499.2	729.1	78.0	35.7	52.2

Table 53. Walleye harvest, quota, effort and CUE for management area 6-1 (NC01, NC02, NC03).

Year	Harvest (kgs)				Quota	%	Gill Net Effort (km)				Gill CUE (kgs/km)		
	NC01	NC02	NC03	Total	(kgs)	Taken	NC01	NC02	NC03	Total	NC01	NC02	NC03
1979	8320	3228	8152	19700	N/A	N/A	375.2	242.7	101.2	719.1	22.2	12.9	79.7
1980	4464	2023	6744	13231	N/A	N/A	88.3	303.8	73.3	465.4	50.6	6.4	66.6
1981	14985	1124	3988	20097	N/A	N/A	329.3	219.3	25.9	574.5	44.3	4.7	42.3
1982	17014	1694	1950	20658	N/A	N/A	452.4	185.7	22.7	660.8	37.6	9.1	41.0
1983	5106	2776	2295	10177	N/A	N/A	172.6	288.3	42.3	503.2	29.6	8.5	33.0
1984	4659	2340	3636	10635	21866	48.6	153.1	312.4	97.4	562.9	30.4	7.0	33.2
1985	12284	2219	2541	17044	21866	77.9	367.8	241.8	43.4	653.0	33.4	8.7	48.6
1986	8135	3649	2569	14353	21867	65.6	334.4	283.6	38.7	656.7	24.3	12.2	35.0
1987	7143	2449	2246	11838	21752	54.4	268.2	245.6	91.2	605.0	26.6	7.0	20.1
1988	5910	1737	4166	11813	21728	54.4	262.5	140.7	47.1	450.3	22.5	10.6	62.5
1989	10474	3238	2696	16408	22383	73.3	502.7	387.7	31.2	921.6	20.8	7.3	78.7
1990	7943	2002	2529	12474	21224	58.8	267.9	27.3	23.1	318.4	29.6	71.0	64.1

Table 54. Lake trout/backcross harvest, quota and CUE for management area 6-1 (NC01, NC02, NC03).

Year	Harvest (kgs)				Quota	Percent	Gill CUE (kgs/km)		
	NC01	NC02	NC03	Total	(kgs)	Taken	NC01	NC02	NC03
1979	922	2165	9	3096	N/A	N/A	4.7	3.8	0.0
1980	166	2228	53	2447	N/A	N/A	12.3	2.9	5.5
1981	311	1315	8	1634	N/A	N/A	2.7	2.6	0.5
1982	119	36	0	155	N/A	N/A	24.3	2.5	0.0
1983	10	139	0	149	N/A	N/A	0.6	2.0	0.0
1984	38	98	0	136	2403	5.7	2.0	1.2	0.0
1985	41	504	489	1034	2403	43.0	1.6	1.2	3.2
1986	54	1939	2102	4095	5045	81.7	1.4	2.1	5.8
1987	6	2993	974	3973	5055	78.6	0.8	3.8	2.3
1988	39	2436	892	3367	5055	66.6	0.9	3.1	5.4
1989	450	2548	1618	4616	5281	87.4	1.9	3.3	6.8
1990	483	2730	2382	5595	7621	73.4	2.3	5.3	5.7

Table 55. Northern pike harvest and quota for management area 6-1 (NC01, NC02, NC03).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	6777	N/A	N/A
1980	5308	N/A	N/A
1981	11479	N/A	N/A
1982	7702	N/A	N/A
1983	6395	N/A	N/A
1984	7441	16390	45.4
1985	8612	16390	52.5
1986	8133	16389	49.6
1987	5638	16422	34.3
1988	4452	16422	27.1
1989	6422	18888	34.0
1990	6459	18207	35.5

Table 56. Pink salmon harvest and quota for management area 6-1 (NC01, NC02, NC03).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken
1979	1113	N/A	N/A
1980	0	N/A	N/A
1981	7759	N/A	N/A
1982	0	N/A	N/A
1983	31618	N/A	N/A
1984	293	N/A	N/A
1985	13138	129412	10.2
1986	2428	67077	3.6
1987	1296	132568	1.0
1988	647	44597	1.5
1989	5524	71871	7.7
1990	999	25494	3.9

Table 57. Lake whitefish harvest, quota, effort and CUE for management area 6-2 (NC04).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	269	N/A	N/A	9.9	26.8
1980	1444	N/A	N/A	74.3	19.2
1981	95	N/A	N/A	10.5	8.9
1982	3639	N/A	N/A	83.2	37.0
1983	2769	N/A	N/A	36.2	71.7
1984	4188	4796	87.3	45.7	82.0
1985	8689	4796	181.2	132.3	64.7
1986	3396	2365	143.6	39.5	82.3
1987	2265	2388	94.8	47.7	44.5
1988	4676	2388	195.8	59.4	56.8
1989	2591	144	1799.3	58.3	43.9
1990	2956	114	2593.0	81.2	36.4

Table 58. Yellow perch harvest, quota, effort and CUE for management area 6-2 (NC04).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	7653	N/A	N/A	91.3	83.8
1980	1170	N/A	N/A	14.1	80.6
1981	4492	N/A	N/A	58.7	76.8
1982	8582	N/A	N/A	58.2	123.0
1983	9406	N/A	N/A	113.4	74.2
1984	12988	4324	300.4	195.9	66.8
1985	10043	12825	78.3	98.2	103.0
1986	7659	6745	113.6	82.5	92.9
1987	10547	6826	154.5	124.1	85.7
1988	11737	6996	167.8	76.4	131.3
1989	8889	2602	341.6	75.6	106.4
1990	7123	2602	273.8	98.0	72.2

Table 59. Lake trout/backcross harvest, quota and CUE for management area 6-2 (NC04).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	CUE (kgs/km)
1979	26	N/A	N/A	10.0
1980	20	N/A	N/A	1.0
1981	7	N/A	N/A	0.0
1982	8	N/A	N/A	0.0
1983	14	N/A	N/A	0.0
1984	70	340	20.6	0.0
1985	772	340	227.1	6.6
1986	549	567	96.8	6.9
1987	332	342	97.1	3.1
1988	673	342	196.8	14.0
1989	1219	114	1069.3	18.7
1990	1532	114	1343.9	11.7

Table 60. Lake whitefish harvest, quota, effort and CUE for management area 6-3 (NC05).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	992	N/A	N/A	36.3	25.8
1980	231	N/A	N/A	32.1	7.1
1981	83	N/A	N/A	15.4	5.4
1982	852	N/A	N/A	82.0	10.4
1983	592	N/A	N/A	54.2	10.6
1984	559	6759	8.3	13.2	39.2
1985	128	6759	1.9	2.8	46.1
1986	274	5910	4.6	6.4	37.5
1987	82	4338	1.9	11.9	6.8
1988	198	4336	4.6	3.2	61.9
1989	849	4855	17.5	1.1	770.9
1990	2507	4047	61.9	14.8	169.1

Table 61. Yellow perch harvest, quota, effort and CUE for management area 6-3 (NC05).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	Effort (km)	CUE (kgs/km)
1979	6668	N/A	N/A	55.3	120.9
1980	2826	N/A	N/A	51.2	47.4
1981	5611	N/A	N/A	46.8	81.3
1982	2578	N/A	N/A	47.6	50.7
1983	7758	N/A	N/A	146.0	50.6
1984	6153	12825	48.0	113.9	54.4
1985	113	4324	2.6	36.7	58.7
1986	1376	5450	25.2	44.6	31.1
1987	836	5347	15.6	19.0	44.3
1988	4029	5347	75.4	123.1	32.7
1989	5	1245	0.4	5.5	0.9
1990	0	1181	0.0	0.0	0.0

Table 62. Lake trout/backcross harvest, quota and CUE for management area 6-3 (NC05).

Year	Harvest (kgs)	Quota (kgs)	Percent Taken	CUE (kgs/km)
1979	1529	N/A	N/A	29.8
1980	6066	N/A	N/A	44.1
1981	2055	N/A	N/A	65.2
1982	1073	N/A	N/A	1.0
1983	2041	N/A	N/A	25.7
1984	717	1134	63.2	1.0
1985	487	1134	42.9	150.0
1986	563	1134	49.6	57.1
1987	430	1023	42.0	61.6
1988	2135	1023	208.7	523.0
1989	941	877	107.3	4705.0
1990	553	774	71.4	197.5

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APPENDIX 2

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Table 1. Standardized year-class index values from assessment netting projects (average year-class strength = 10).

Year	Whitefish			Chub			Yellow Perch		
Class	LH05	LH08-09	GB10	LH05	LH08-09	GB10	LH05	LH08-09	NC03
1975			0.4						
1976			0.4			1.3			
1977			16.1	13.6	13.9	3.6			
1978	6.7		5.5	5.2	4.8	4.0			
1979	6.8		2.1	3.3	4.3	22.4	0.3		
1980	9.8		1.4	10.5	6.6	10.5	7.5		
1981	8.7	0.2	0.8	4.8	2.8	4.2	5.4	12.2	
1982	8.4	12.0	19.1	20.3	34.3	4.7	4.8	8.3	11.1
1983	5.5	1.5	2.5	12.7	13.4	50.2	27.6	4.8	24.9
1984	4.8	1.3	0.9	22.2	19.2	5.3	4.0	1.5	2.5
1985	9.7	5.0	4.7	3.0	6.0	2.2	0.4	5.3	2.3
1986	16.3	21.4	5.9	2.7	2.0	1.9	13.9	18.0	4.9
1987	22.0	9.6	27.8	1.8	1.3	0.8	24.3	18.8	27.5
1988	7.0	18.6	43.9	34.0	11.0	5.4	6.6	16.2	5.9
1989	10.3	29.2	40.7		0.0	0.5	0.0	3.3	8.4

Table 2. Catch-per-unit effort (number/trap night) of age 1 walleye at Tremblay Creek index site (1987-89 values adjusted due to changes in water clarity.

Year	Age 1 CUE
1977	3.12
1978	0.22
1979	0.62
1980	1.08
1981	0.09
1982	4.05
1983	0.01
1984	2.05
1985	1.94
1986	1.97
1987	0.21
1988	0.15
1989	0.09

Table 3. Lake whitefish CUE-at-age (number/km of gill net) - comparison of North Channel cooperative index fishing program and assessment projects.

Age (years)	Whitefish		
	NC02	LH05	LH08-09
1	3.56	34.79	68.72
2	13.08	21.64	33.58
3	4.36	7.58	0.25

APPENDIX 3

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List of commercial fishermen and contractors involved in the onboard commercial catch sampling, 1990.

FISHERMEN:

Carlson Brothers Fisheries
Deeg, John
E & E Carlson Brothers
Edmonstone, Roland Bud
Family Fish Company Limited
Goodison, Harold and Sons
Hopper Fisheries Limited
Hore, Murray
Huber Fisheries
Ken and Murray Loop Fishery Limited
L & S Fisheries
Lang, Steven Fisheries
Liddle Brothers Fisheries Limited
Meneray Fisheries Limited
Mitchell, Wayne
North Channel Fisheries
Nyman, B & G Fisheries
Nyman Brothers Fisheries
Pilon Fisheries Limited
Purdy Fisheries Limited
Telford, Stanley
Raney, Russell
Southampton Fish Company
Telford, Stan
The Purvis Brothers Limited
Witty, Willard

CONTRACTORS:

Austin Environmental Services
Salmonid/Environmental Consulting
Witty, Mark